United States
Department of
Agriculture

Soil
Conservation
Service

In cooperation with
United States Department
of the Interior, Bureau of
Land Management, and
Utah Agricultural
Experiment Station

Soil Survey of Henry Mountains Area, Utah,

Parts of Garfield, Kane, and Wayne Counties

How To Use This Soil Survey

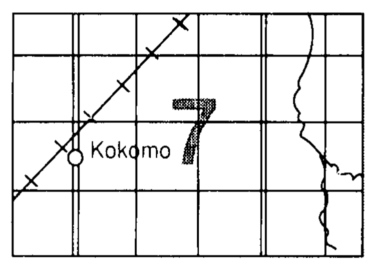
General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

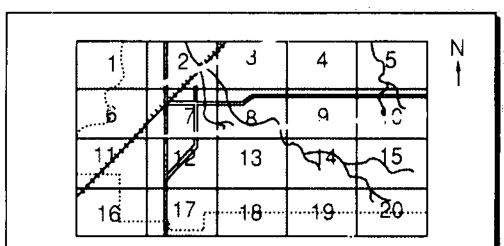
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.



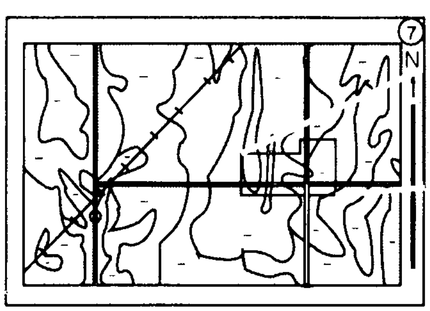
MAP SHEET

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.

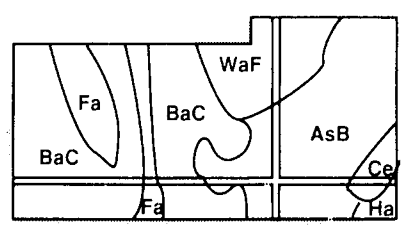


INDEX TO MAP SHEETS

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



MAP SHEET



AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, handicap, or age.

Major fieldwork for this soil survey was completed in 1979. Soil names and descriptions were approved in 1982. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1979. This survey was made cooperatively by the Soil Conservation Service, the Bureau of Land Management, and the Utah Agricultural Experiment Station. It is part of the technical assistance furnished to the Canyonlands and Fremont River Soil Conservation Districts.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: Area of Rizno soils in foreground; Canyon family soils and Rock outcrop on Mount Holmes in background.

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Taxonomic Units

Issued February 1990

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Foreword

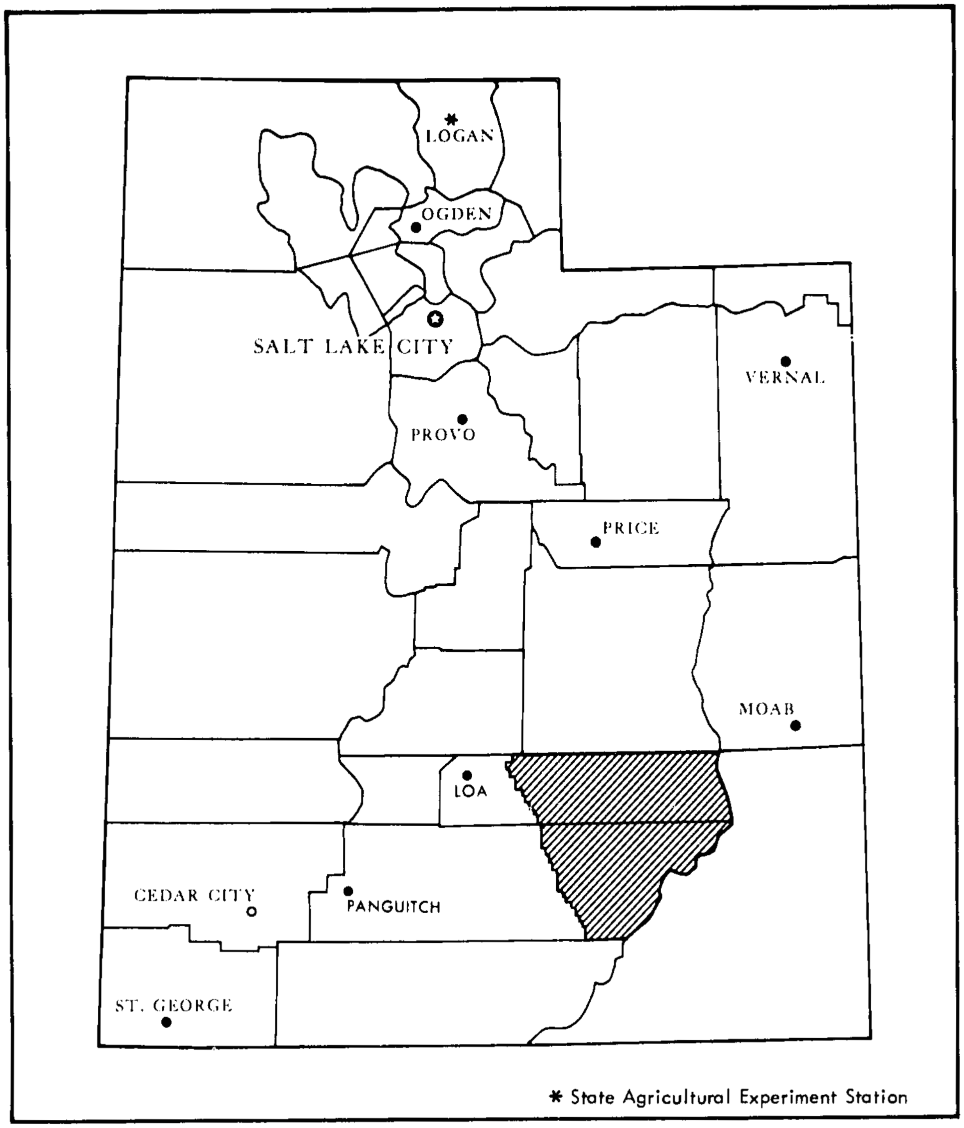
This soil survey contains information that can be used in land-planning programs in Henry Mountains Area, Utah, Parts of Garfield, Kane, and Wayne Counties. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Francis T. Holt
State Conservationist
Soil Conservation Service



Location of Henry Mountains Area, Utah, Parts of Garfield, Kane, and Wayne Counties.

Soil Survey of
Henry Mountains Area, Utah
Parts of Garfield, Kane, and Wayne Counties

By Joseph M. Downs, Soil Conservation Service

Fieldwork by Vear Mortenson, Laurel H. Stott, and
Hal K. Swenson, Soil Conservation Service, and
Weston M. Warren, Bureau of Land Management

United States Department of Agriculture, Soil Conservation Service
In cooperation with
United States Department of the Interior, Bureau of Land Management,
and Utah Agricultural Experiment Station

HENRY MOUNTAINS AREA, UTAH, PARTS OF GARFIELD, KANE, AND WAYNE COUNTIES, is in the southeastern part of Utah. It is bounded on the west by Capitol Reef National Park, on the east by the Green River, on the south by the Colorado River, and on the north by Emery County. It has a total area of about 1,984,345 acres, or 3,101 square miles. Of this total, 983,777 acres is in 1 Garfield County, 6,789 acres is in Kane County, and 993,779 acres is in Wayne County.

Hanksville, in Wayne County, serves as the trading center and provides tourist accommodations. A marina at Bullfrog, in Kane County, is a center for recreational activities.

Utah State Highway 24 runs west to Richfield, 110 miles from Hanksville, and north and east to Interstate 70 and Green River, 58 miles from Hanksville. Utah State Highway 95 extends south toward Hite and Bullfrog Basin, both of which are recreational areas on the Colorado River. Halls Creek Road, on the west, follows the Waterpocket Fold through Notom on the south to Bullfrog Basin.

There are no public transportation facilities in or out of the survey area. A federally administered airport is northeast of Hanksville.

Elevation in the survey area ranges from about 4,000 feet near Bullfrog to 11,500 feet atop Mount Ellen. Precipitation ranges from about 5 inches at Hanksville to about 30 inches at Mount Ellen.

The main drainageways west of the Dirty Devil River are the Fremont River, which crosses the basin from west to east, and Muddy Creek, which originates in the north and flows southeasterly. The confluence of these two streams near Hanksville forms the Dirty Devil River, which flows southward into the Colorado River. Other streams originate in the Henry Mountains: To the north is Sweetwater Creek, and to the south is Bullfrog Creek. Neither stream carries much water, and during the hot summer months both of them are intermittent. Along the Waterpocket Fold, there are two other drainageways: Halls Creek, which flows southward, and Sandy Wash, which flows northward.

Most of the survey area is used as rangeland. There is some irrigated cropland along the Fremont River, from Cainville to Hanksville, and in the Sandy Ranch, King Ranch, Fairview Ranch, Notom, and Trachyte areas.

Descriptions, names, and delineations of soils in this soil survey do not fully agree with those on soil maps for adjacent survey areas. Differences are the result of better knowledge of soils, modifications in series concepts, intensity of mapping, or the extent of soils within the survey.

Climate

E. Arlo Richardson, state climatologist, Utah Department of Agriculture, helped to prepare this section.

Elevation of the survey area ranges from about 4,000 feet to more than 11,500 feet at the top of Mount Ellen, in the Henry Mountains. In general, the climate of the lower elevations is semiarid. It is characterized by abundant sunshine, meager precipitation, dry air, and relatively light winds. As one moves up the mountain slopes, the annual precipitation increases rapidly from 5 to 6 inches at the lower elevations to nearly 30 inches near the top of the mountains.

As is typical of semiarid regions, there is great variability in most of the climatic features from one year to another. The period of maximum precipitation in this survey area, in contrast with many other parts of the intermontane area, is associated with summer thunderstorm activity as moist air moves northward from the Gulf of Mexico. These thunderstorms occasionally produce heavy downpours that may bring 1.5 inches of rain or more within a few hours. Flash floods of short duration are common along many of the shallow streambeds leading from the mountain slopes.

Temperature and precipitation data for Bullfrog Basin, Hite Marina, and Hanksville are given in table 1.

Summers are characterized by hot weather in the lower valleys, where maximum temperatures of more than 100 degrees occur during most years at elevations of less than 5,500 feet; however, the low humidity that normally exists during this season makes these high temperatures more bearable here than in more humid areas.

Winters are cold, and subzero minimum temperatures are recorded several times each year in most areas at lower elevations. Strong temperature inversions persist in the lower valleys, and they frequently extend to about 1,000 feet above the valley floors. Above the top of the inversions, temperatures decrease about 3.5 degrees per 1,000 foot increase in elevation.

Snowfall usually is light, commonly less than 10 inches per year at the lower elevations, but occasional storms deposit as much as 2 feet of snow. Snowfall accumulates to an estimated 100 inches or more on the higher mountain slopes.

The average length of the growing season is also strongly influenced by the local topography. It ranges from nearly 210 days in the warmer areas to less than 20 days on the mountaintops.

Estimated monthly pan evaporation is given in table 2.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biologic activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind or segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Individual soils on the landscape commonly merge gradually onto one another as their characteristics gradually change. To construct an accurate map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size, and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While the soil survey was in progress, samples of some of the soils in the area were collected for

laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses and under different levels of management. Some interpretations were modified to fit local conditions, and some new interpretations were developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The soils or miscellaneous areas making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils or miscellaneous areas can be identified on the map. Likewise, areas that are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The general map units in this survey have been grouped into general kinds of landscape for broad interpretive purposes. Each of the broad groups and the map units in each group are described in the following pages.

Map Unit Descriptions

Dominantly very deep to shallow, well drained and somewhat excessively drained, gently sloping to very steep soils in the arid climatic zone

This group consists of three map units. It makes up about 24 percent of this survey area.

This group is used mainly as rangeland and wildlife habitat. It is also used as irrigated cropland.

1. Moffat-Sheppard-Blackston

Very deep, well drained and somewhat excessively drained, gently sloping to steep soils; on benches, alluvial fans, upland terraces, and hillsides and in valleys

This map unit is in the north-central, central, and southern parts of the survey area. Slope is 2 to 30 percent. The vegetation on these soils is mainly galleta, Indian ricegrass, blackbrush, and Mormon-tea. The Sheppard soils also support sand sagebrush and spike dropseed. Elevation is 3,800 to 5,700 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 48 to 53 degrees F, and the average freeze-free season is 140 to 160 days.

This unit makes up about 12 percent of the survey area. It is about 35 percent Moffat and similar soils, 25 percent Sheppard soils, and 10 percent Blackston soils. The remaining 30 percent is components of minor extent.

Moffat soils are on upland benches, on alluvial fans, and in valleys. These soils are very deep and well drained. They formed in alluvial and eolian material derived dominantly from sandstone. The surface layer is light reddish brown loamy fine sand about 2 inches thick. Below this to a depth of 60 inches or more the soils are reddish brown to pinkish white fine sandy loam.

Sheppard soils are on upland benches, alluvial fans, and hillsides and in valleys. These soils are very deep and somewhat excessively drained. They formed in eolian deposits and alluvium derived dominantly from sandstone. The soils are light reddish brown and pink loamy fine sand throughout.

Blackston soils are on upland terraces and rolling hillsides. These soils are very deep and well drained. They formed in alluvium derived dominantly from sandstone and diorite. The surface layer is brown gravelly fine sandy loam about 4 inches thick. The next layer to a depth of 25 inches is light brown and pale brown very cobbly clay loam. Below this to a depth of 60 inches or more is very pale brown extremely cobbly loamy sand.

Of minor extent in the unit are Trachute, Monue, Goblin, Monue Variant, Billings, Trail, and Billings Variant soils.

This unit is used mainly as rangeland and wildlife habitat. It is also used as irrigated cropland.

2. Robroost-Sheppard-Goblin

Shallow and very deep, well drained and somewhat excessively drained, gently sloping to steep soils; on alluvial fans, benches, hillsides, and upland pediment surfaces and in valleys

This map unit is in the north-central part of the survey area, near Hanksville, west of Cainville, and south of Notom. Slope is 2 to 30 percent. The vegetation on the Robroost and Goblin soils is mainly shadscale, Mormon-tea, and galleta. The vegetation on the Sheppard soils is mainly sand sagebrush, spike dropseed, Mormon-tea,

and Indian ricegrass. Elevation is 4,900 to 5,700 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 47 to 53 degrees F, and the average freeze-free season is 140 to 160 days.

This unit makes up about 4 percent of the survey area. It is about 30 percent Robroost and similar soils, 15 percent Sheppard soils, and 10 percent Goblin soils. The remaining 45 percent is components of minor extent.

Robroost soils are on alluvial fans and in valleys. These soils are very deep and well drained. They formed in alluvium derived dominantly from gypsiferous shale and sandstone. The surface layer is light reddish brown fine sandy loam about 5 inches thick. The subsoil is light reddish brown loam about 5 inches thick. Below this to a depth of 60 inches or more is light reddish brown loam that has common to many veins and splotches of gypsum.

Sheppard soils are on upland benches, alluvial fans, and hillsides and in valleys. These soils are very deep and somewhat excessively drained. They formed in eolian deposits and alluvium derived dominantly from sandstone. The soils are light reddish brown and pink loamy fine sand throughout.

Goblin soils are on dissected uplands, hillsides, and upland pediment surfaces. These soils are shallow and well drained. They formed in residuum derived dominantly from gypsiferous shale and sandstone. The surface layer is light reddish brown loam about 3 inches thick. Below this to a depth of 12 inches is yellowish red loam that has common crystals and veins of gypsum. Weathered gypsiferous shale is at a depth of 12 inches.

Of minor extent in the unit are Trachute, Farb, Mivida, Mido, Blackston, Hanksville, Moffat, Chipeta, and Moenkopie soils and Rock outcrop.

This unit is used as rangeland and wildlife habitat.

3. Chipeta-Hanksville-Leebench

Shallow, moderately deep, and very deep, well drained, nearly level to very steep soils; on mesas, benches, hillsides, alluvial fans, and fan terraces

This map unit is in Wayne County, west of Hanksville. Slope is 0 to 60 percent. The vegetation is mainly mat saltbush, deserttrumpet, shadscale, and galleta. Elevation is 4,200 to 6,000 feet. The average annual precipitation is about 5 to 10 inches, the average annual air temperature is 48 to 52 degrees F, and the average freeze-free season is 130 to 160 days.

This unit makes up about 8 percent of the survey area. It is about 50 percent Chipeta soils, 15 percent Hanksville soils, and 5 percent Leebench soils. The remaining 30 percent is components of minor extent.

Chipeta soils are on mesas, benches, and low, rolling hillsides. These soils are shallow and well drained. They formed in residuum and colluvium derived dominantly from shale. The surface layer is light brownish gray gravelly silty clay about 3 inches thick. Below this to a depth of 15 inches is light olive brown silty clay loam. Weathered shale is at a depth of 15 inches.

Hanksville soils are on benches, alluvial fans, and dissected hillsides. These soils are moderately deep and well drained. They formed in alluvium derived dominantly from shale. The surface layer is olive gray clay loam about 7 inches thick. Below this to a depth of 39 inches is olive gray clay loam and silty clay. Weathered shale is at a depth of 39 inches. These soils are moderately to strongly affected by salts and alkali.

Leebench soils are on mesas, benches, alluvial fans, and fan terraces. These soils are very deep and well drained. They formed in alluvium derived dominantly from shale, sandstone, and diorite. The surface layer is very pale brown gravelly clay loam about 3 inches thick. The subsoil is brown clay loam about 5 inches thick. Below this to a depth of 60 inches or more is pale brown gravelly clay loam.

Of minor extent in this unit are Badland, Rock outcrop, and Cerrillos Variant, Moenkopie, Farb, Travessilla, and Goblin soils.

This unit is used as rangeland and wildlife habitat.

Dominantly shallow and very shallow, well drained and excessively drained, gently sloping to very steep soils and Rock outcrop in the arid and semiarid climatic zone

This group consists of four map units. It makes up about 44 percent of the survey area.

This group is used as rangeland and wildlife habitat.

4. Farb-Pennell-Moenkopie

Shallow, well drained and excessively drained, gently sloping to very steep soils; on benches, mesas, and hillsides

This map unit is in the northern and eastern parts of the survey area. Slope is 2 to 50 percent. The vegetation on the Farb and Moenkopie soils is mainly blackbrush, Mormon-tea, galleta, and Indian ricegrass. The vegetation on the Pennell soils is galleta, shadscale, Indian ricegrass, and Mormon-tea. Elevation is 3,600 to 5,200 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 53 degrees F, and the average freeze-free season is 140 to 160 days.

This unit makes up about 5 percent of the survey area. It is about 30 percent Farb soils, 25 percent Pennell soils, and 20 percent Moenkopie soils. The remaining 25 percent is components of minor extent.

Farb soils are on mesas, benches, and hillsides. These soils are very shallow and excessively drained. They formed in residuum and alluvium derived dominantly from sandstone. The surface layer is strong brown fine sandy loam about 1 inch thick. Below this to a depth of 19 inches are reddish yellow fine sandy loam

and sandy loam. Unweathered sandstone is at a depth of 19 inches.

Pennell soils are on mesas, benches, and hillsides. These soils are shallow and well drained. They formed in residuum and colluvium derived dominantly from sandstone and siltstone. The surface layer is yellowish red fine sandy loam about 3 inches thick. The upper 5 inches of the substratum is reddish yellow fine sandy loam. Below this to a depth of 15 inches is pink channery loam. Unweathered sandstone is at a depth of 15 inches.

Moenkopie soils are on benches and mesas. These soils are shallow and well drained. They formed in residuum and alluvium derived dominantly from sandstone. The surface layer is light brown fine sandy loam about 3 inches thick. Below this to a depth of 17 inches is light reddish brown fine sandy loam. Unweathered sandstone is at a depth of 17 inches.

Of minor extent in the unit are Moffat, Sheppard, Monue, Stormitt, and Travessilla soils and Rock outcrop.

This unit is used as rangeland and wildlife habitat.

5. Badland-Rock outcrop-Chipeta

Badland, Rock outcrop, and shallow, well drained, gently sloping to very steep soils; on mesas, benches, and hillsides

This map unit is in the western and southern parts of the survey area. Slope is 2 to 60 percent. The vegetation on the Chipeta soils is mainly mat saltbush, deserttrumpet, shadscale, and galleta. Elevation is 4,000 to 6,000 feet. The average annual precipitation is about 5 to 10 inches, the average annual air temperature is 48 to 52 degrees F, and the average freeze-free season is 130 to 160 days.

This unit makes up about 19 percent of the survey area. It is about 50 percent Badland, 20 percent Rock outcrop, and 10 percent Chipeta soils. The remaining 20 percent is components of minor extent.

Badland consists of steep and very steep, barren areas of shale that are dissected by many intermittent drainageways.

Rock outcrop consists of barren or nearly barren areas of sandstone. It occurs mainly as slickrock, nearly vertical cliffs, and escarpments.

Chipeta soils are on mesas, benches, and hillsides. These soils are shallow and well drained. They formed in residuum and colluvium derived dominantly from shale. The surface layer is light brownish gray gravelly silty clay about 3 inches thick. Below this to a depth of 15 inches is light olive brown silty clay loam. Weathered shale is at a depth of 15 inches.

Of minor extent in the unit are Travessilla, Farb, and Hanksville soils.

This unit is used as rangeland and wildlife habitat.

6. Rock outcrop-Moenkopie-Arches

Rock outcrop, and shallow, well drained, gently sloping to steep soils; on benches, mesas, old pediment surfaces, and hillsides

This map unit is in the eastern part of the survey area. Slope is 2 to 50 percent. The vegetation on the Moenkopie soils is blackbrush, galleta, and shadscale. The vegetation on the Arches soils is mainly very sparse Utah juniper, pinyon, Mormon-tea, and Indian ricegrass. Elevation is 3,600 to 6,400 feet. The average annual precipitation is about 5 to 11 inches, the average annual air temperature is 45 to 53 degrees F, and the average freeze-free season is 120 to 160 days.

This unit makes up about 4 percent of the survey area. It is about 55 percent Rock outcrop, 15 percent Moenkopie and similar soils, and 10 percent Arches soils. The remaining 20 percent is components of minor extent.

Rock outcrop consists of barren or nearly barren areas of sandstone. It occurs mainly as slickrock, nearly vertical cliffs, and escarpments.

Moenkopie soils are on benches, mesas, and old pediment surfaces. These soils are shallow and well drained. They formed in residuum and alluvium derived dominantly from sandstone. The surface layer is light brown fine sandy loam about 3 inches thick. Below this to a depth of 17 inches is light reddish brown fine sandy loam. Unweathered sandstone is at a depth of 17 inches.

Arches soils are on hillsides. These soils are shallow and well drained. They formed in residual and eolian deposits derived dominantly from sandstone. The soils are yellowish red loamy fine sand throughout. Sandstone is at a depth of 14 inches.

Of minor extent in the unit are Mellenthin, Mido, Sheppard, Pennell, Travessilla, and Bowdish soils and Badland.

This unit is used as rangeland and wildlife habitat.

7. Rock outcrop

Exposed areas of hard bedrock

This map unit is in the eastern part of the survey area.

This unit makes up about 16 percent of the survey area. It is about 90 percent Rock outcrop. The remaining 10 percent is components of minor extent.

Rock outcrop consists of barren or nearly barren areas of sandstone. It occurs mainly as slickrock, nearly vertical cliffs, and escarpments.

Of minor extent in the unit are Moenkopie, Pennell, Travessilla, and Tolman soils.

This unit is used as wildlife habitat.

Dominantly very deep, moderately deep, and shallow, well drained and excessively drained, nearly level to very steep soils in the semiarid climatic zone

This group consists of four map units. It makes up about 25 percent of the survey area.

This group is used mainly as rangeland and wildlife habitat. It is also used for irrigated crops.

8. Milok-Wayneco-Mido

Very deep and shallow, well drained and excessively drained, nearly level to steep soils; on mesas, benches, ridges, fan terraces, and hillsides and in valleys

This map unit is in the northeastern, northwestern, and southern parts of the survey area. Slope is 0 to 30 percent. The vegetation on the Milok and Wayneco soils is mainly blackbrush, Indian ricegrass, galleta, and Mormon-tea. The vegetation on the Mido soils is mainly Indian ricegrass, Mormon-tea, sand dropseed, sand sagebrush, and sandhill muhly. Elevation is 4,800 to 6,400 feet. The average annual precipitation is about 8 to 12 inches, the average annual air temperature is 45 to 52 degrees F, and the average freeze-free season is 120 to 150 days.

This unit makes up about 4 percent of the survey area. It is about 30 percent Milok and similar soils, 20 percent Wayneco soils, and 15 percent Mido soils. The remaining 35 percent is components of minor extent.

Milok soils are on benches, mesas, ridges, and fan terraces. These soils are very deep and well drained. They formed in alluvial and eolian deposits derived dominantly from sandstone. The surface layer is yellowish red loamy fine sand about 4 inches thick. The subsoil is reddish yellow loamy fine sand about 8 inches thick. Below this to a depth of 60 inches or more is light brown and reddish yellow fine sandy loam and gravelly loamy sand.

Wayneco soils are on mesas, benches, ridges, and hillsides. These soils are shallow and well drained. They formed in residuum and colluvium derived dominantly from sandstone. The surface layer is yellowish red fine sandy loam about 3 inches thick. The subsoil is yellowish red loamy fine sand 6 inches thick. Below this to a depth of 19 inches is reddish yellow fine sandy loam. Unweathered sandstone is at a depth of 19 inches.

Mido soils are on mesas and benches and in broad valleys. These soils are very deep and excessively drained. They formed in eolian deposits derived dominantly from sandstone. The soils are reddish brown loamy fine sand to a depth of 60 inches or more.

Of minor extent in the unit are Begay, Yarts, Bowdish, Moffat, and Sheppard soils and Duneland.

This unit is used as rangeland and wildlife habitat.

9. Begay-Mido-Mellenthin

Shallow and very deep, well drained and excessively drained, gently sloping to moderately steep soils; on mesas, benches, alluvial fans, and hillsides and in valleys

This map unit is in the northeastern part of the survey area. Slope is 8 to 12 percent. The vegetation on the Begay soils is mainly Indian ricegrass, needleandthread, galleta, and Mormon-tea. The vegetation on the Mido soils is mainly Indian ricegrass, sand dropseed, Mormon-tea, sand sagebrush, and sandhill muhly. The vegetation on the Mellenthin soils is mainly Utah juniper, pinyon, Mormon-tea, and Indian ricegrass. Elevation is 4,800 to 6,500 feet. The average annual precipitation is about 8 to 12 inches, the average annual air temperature is 45 to 52 degrees F, and the average freeze-free season is 120 to 150 days.

This unit makes up about 12 percent of the survey area. It is about 30 percent Begay and similar soils, 15 percent Mido soils, and 10 percent Mellenthin and similar soils. The remaining 45 percent is components of minor extent.

Begay soils are on benches, mesas, and alluvial fans and in valleys. These soils are very deep and well drained. They formed in alluvial and eolian deposits derived dominantly from sandstone. The surface layer is reddish brown loamy fine sand about 5 inches thick. The subsoil is reddish brown very fine sandy loam about 7 inches thick. Below this to a depth of 60 inches or more is reddish yellow and light reddish brown fine sandy loam.

Mido soils are on mesas and benches in valleys. These soils are very deep and excessively drained. They formed in eolian deposits derived dominantly from sandstone. The soils are reddish brown loamy fine sand to a depth of 60 inches or more.

Mellenthin soils are on mesas and hillsides. These soils are shallow and well drained. They formed in residuum derived dominantly from sandstone. The surface layer is yellowish red gravelly fine sandy loam about 3 inches thick. Below this to a depth of 16 inches is reddish brown and light reddish brown very channery fine sandy loam. Unweathered sandstone is at a depth of 16 inches.

Of minor extent in the unit are Wayneco, Moffatt, Rizno, Arches, Travessilla, Mivida, Mido, Milok, and Yarts soils and Rock outcrop.

This unit is used as rangeland and wildlife habitat.

10. Travessilla-Yarts-Shedado

Shallow, moderately deep, and very deep, well drained, nearly level to very steep soils; on mesas, benches, hillsides, and alluvial fans

This map unit is in several areas throughout the survey area. Slope is 1 to 50 percent. The vegetation on the Travessilla soils is mainly blackbrush, Mormon-tea, and galleta. The vegetation on the Yarts and Shedado soils is Indian ricegrass, galleta, Mormon-tea, and needleandthread. Elevation is 5,000 to 6,500 feet. The

average annual precipitation is about 8 to 12 inches, the average annual air temperature is 47 to 52 degrees F, and the average freeze-free season is 120 to 150 days.

This unit makes up about 4 percent of the survey area. It is about 40 percent Travessilla and similar soils, 20 percent Yarts and similar soils, and 10 percent Shedado soils. The remaining 30 percent is components of minor extent.

Travessilla soils are on mesas, benches, and hillsides. These soils are shallow and well drained. They formed in residual and eolian deposits derived dominantly from sandstone. The surface layer is light yellowish brown fine sandy loam about 6 inches thick. Below this to a depth of 12 inches is pale brown fine sandy loam. Unweathered sandstone is at a depth of 12 inches.

Yarts soils are on benches and alluvial fans. These soils are very deep and well drained. They formed in alluvial and eolian deposits derived dominantly from sandstone. The surface layer is yellowish red fine sandy loam about 3 inches thick. Below this to a depth of 60 inches or more is yellowish red and reddish brown fine sandy loam.

Shedado soils are on alluvial fans and hillsides. These soils are moderately deep and well drained. They formed in alluvial and eolian deposits derived dominantly from sandstone. The surface layer is light reddish brown fine sandy loam about 3 inches thick. Below this to a depth of 22 inches is light reddish brown fine sandy loam. Weathered shale and sandstone are at a depth of 22 inches.

Of minor extent in the unit are Strych, Stormitt, Wayneco, Milok, Pastern, Haverdad, and Chipeta soils and Badland.

This unit is used mainly as rangeland and wildlife habitat. It is also used for irrigated crops.

11. Rizno-Chipeta-Begay

Shallow and very deep, well drained, gently sloping soils; on mesas, benches, ridges, alluvial fans, and hillsides and in valleys

This map unit is in the southern part of the survey area. Slope is 2 to 6 percent. The vegetation on the Rizno and Begay soils is mainly galleta, Indian ricegrass, needleandthread, and Mormon-tea. Blackbrush grows on some of the Rizno soils. The vegetation on the Chipeta soils is mat saltbush, deserttrumpet, shadscale, and galleta. Elevation is 4,200 to 6,400 feet. The average annual precipitation is about 5 to 12 inches, the average annual air temperature is 45 to 52 degrees F, and the average freeze-free season is 120 to 150 days.

This unit makes up about 5 percent of the survey area. It is about 40 percent Rizno and similar soils, 20 percent Chipeta soils, and 5 percent Begay and similar soils. The remaining 35 percent is components of minor extent.

Rizno soils are on mesas, benches, ridges, and hillsides. These soils are shallow and well drained. They formed in residual and eolian deposits derived dominantly from sandstone. The surface layer is yellowish red fine sandy loam about 4 inches thick. The upper 6 inches of the substratum is yellowish red fine sandy loam, and the lower part to a depth of 18 inches is light reddish brown channery loam. Unweathered sandstone is at a depth of 18 inches.

Chipeta soils are on mesas, benches, and hillsides. These soils are shallow and well drained. They formed in residuum and colluvium derived dominantly from shale. The surface layer is light brownish gray gravelly silty clay about 3 inches thick. Below this to a depth of 15 inches is light olive brown silty clay loam. Weathered shale is at a depth of 15 inches.

Begay soils are on mesas, benches, and alluvial fans and in valleys. These soils are very deep and well drained. They formed in alluvial and eolian deposits derived dominantly from sandstone. The surface layer is light reddish brown loamy fine sand about 5 inches thick. The subsoil is reddish brown very fine sandy loam about 7 inches thick. Below this to a depth of 60 inches or more is reddish yellow and light reddish brown very fine sandy loam.

Of minor extent in this unit are Mellenthin, Mido, Wayneco, Pennell, Travessilla, and Moenkopie soils and Badland.

This unit is used as rangeland and wildlife habitat.

Dominantly shallow, moderately deep, and very deep, well drained, sloping to very steep soils in the dry subhumid climatic zone

This group consists of one map unit. It makes up about 4 percent of the survey area.

This group is used as woodland, rangeland, and wildlife habitat.

12. Montosa family-Circleville-Blazon

Shallow, moderately deep, and very deep, well drained, sloping to very steep soils; on fans, fan terraces, benches, and mountainsides

This map unit is mainly in the Henry Mountains. It is mainly on fans, fan terraces, benches, and mountainsides. Slope is 4 to 50 percent. The vegetation on the Circleville soils is mainly big Wyoming sagebrush, blue grama, and Nevada bluegrass. The vegetation on the Blazon and Montosa family soils is pinyon, Utah juniper, muttongrass, and blue grama. Some areas have been chained and seeded to other species. Elevation is dominantly 6,500 to 8,000 feet. The average annual precipitation is dominantly 12 to 16 inches, the average annual air temperature is 40 to 50 degrees F, and the average freeze-free season is 75 to 100 days.

This unit makes up about 4 percent of the survey area. It is about 35 percent Montosa family soils, 15 percent Circleville and similar soils, and 15 percent Blazon and similar soils. The remaining 35 percent is components of minor extent.

Montosa family soils are on alluvial fans, benches, and mountainsides. These soils are very deep and well drained. They formed in alluvium and colluvium derived dominantly from diorite and sandstone. The surface layer is brown cobbly very fine sandy loam about 3 inches thick. The subsoil is brown very cobbly loam 8 inches thick. Below this to a depth of 60 inches or more are brown and pale brown very cobbly coarse sandy loam and extremely cobbly loamy coarse sand.

Circleville soils are on upland fans and fan terraces. These soils are moderately deep and well drained. They formed in alluvium and residuum derived dominantly from diorite. The surface layer is dark grayish brown cobbly loam and cobbly clay loam about 7 inches thick. The subsoil is brown very cobbly clay loam 8 inches thick. Below this to a depth of 36 inches is brown very gravelly loam. Unweathered diorite is at a depth of 36 inches.

Blazon soils are on upland fans. These soils are shallow and well drained. They formed in residuum and alluvium derived dominantly from shale. The surface layer is grayish brown cobbly clay loam about 4 inches thick. Below this to a depth of 11 inches is brown clay loam. Weathered shale is at a depth of 11 inches.

Of minor extent in the unit are Stormitt, Tolman, Redcreek, Windwhistle Variant, Delson, Makoti family, and Datino family soils and Rock outcrop.

This unit is used as woodland, rangeland, and wildlife habitat.

Dominantly very deep to shallow, well drained, moderately steep to very steep soils in the humid climatic zone

This group consists of two map units. It makes up about 3 percent of the survey area.

This group is used as woodland, rangeland, wildlife habitat, and watershed.

13. Delson-Datino family-Makoti family

Moderately deep to very deep, well drained, moderately steep to very steep soils; on mountainsides

This map unit is in the Henry Mountains. It is mainly on mountainsides. Slope is 15 to 50 percent. The vegetation on the Delson and Makoti family soils is mainly pinyon, muttongrass, and bluebunch wheatgrass. The vegetation on the Datino family soils is Gambel oak, Utah serviceberry, Utah snowberry, and mountain big sagebrush. Elevation is 7,500 to 10,000 feet. The average annual precipitation is about 16 to 25 inches, the average annual air temperature is 34 to 43 degrees F, and the average freeze-free season is 30 to 75 days.

This unit makes up about 2 percent of the survey area. It is about 55 percent Delson soils, 15 percent Datino family soils, and 10 percent Makoti family soils. The remaining 20 percent is components of minor extent.

Delson soils are on mountainsides. These soils are very deep and well drained. They formed in alluvium derived dominantly from diorite, shale, and sandstone. The surface layer is dark grayish brown cobbly loam about 15 inches thick. The subsoil is brown cobbly clay 25 inches thick. Below this to a depth of 60 inches or more is brown very cobbly clay.

Datino family soils are on mountainsides. These soils are moderately deep and well drained. They formed in alluvium and colluvium derived dominantly from shale. The surface layer is brown loam about 10 inches thick. The subsoil is brown very gravelly clay loam to a depth of 21 inches. Unweathered shale is at a depth of 21 inches.

Makoti family soils are on mountainsides. These soils are deep and well drained. They formed in alluvium and colluvium derived dominantly from shale. The surface layer is very dark grayish brown clay loam about 4 inches thick. The subsoil is dark grayish brown silty clay loam 20 inches thick. Below this to a depth of 41 inches is grayish brown silty clay loam. Weathered shale is at a depth of 41 inches.

Of minor extent in this unit are Circleville, Blazon, Tolman, Rogert Variant, and Rogert soils and Rock outcrop.

This unit is used as rangeland, woodland, wildlife habitat, and watershed.

14. Pando family-Rogert-Olnes family

Deep and shallow, well drained, very steep soils; on mountainsides

This map unit is in the higher parts of the Henry Mountains. Slope is 50 to 70 percent. The vegetation on the Pando family soils is mainly quaking aspen, currant, black sagebrush, and antelope bitterbush. The vegetation on the Rogert soils is black sagebrush, bluegrass, and Salina wildrye. The vegetation on the Olnes family soils is Engelmann spruce, subalpine fir, quaking aspen, pinegrass, and blueberry. Elevation is 8,400 to 11,500 feet. The average annual precipitation is about 20 to 30 inches, the average annual air temperature is 32 to 38 degrees F, and the average freeze-free season is 20 to 60 days.

This unit makes up about 1 percent of the survey area. It is about 35 percent Pando family soils, 25 percent Rogert and similar soils, and 15 percent Olnes family soils. The remaining 25 percent is components of minor extent.

Pando family soils are on mountainsides. These soils are deep and well drained. They formed in colluvium derived dominantly from diorite and shale. The surface is covered with a mat of twigs and litter about 2 inches thick. The surface layer is brown cobbly loam about 10 inches thick. The subsurface layer is light brownish gray very cobbly loam 15 inches thick. The subsoil is yellowish brown very cobbly loam to the depth of 55 inches. Unweathered shale is at a depth of 55 inches.

Rogert soils are on mountainsides. These soils are shallow and well drained. They formed in colluvium and residuum derived dominantly from diorite. The surface layer is dark grayish brown very gravelly loam 9 inches thick. Below this to a depth of 18 inches is brown very gravelly loam. Unweathered diorite is at a depth of 18 inches.

Olnes family soils are on mountainsides. These soils are deep and well drained. They formed in colluvium derived dominantly from diorite. The surface is covered with a mat of organic material about 4 inches thick. The surface layer is brown cobbly loam about 6 inches thick. Below this to a depth of 59 inches are pink very cobbly loam and extremely cobbly loam. Unweathered diorite is at a depth of 59 inches.

Of minor extent in this unit are Delson, Datino family and Rogert Variant soils and Rock outcrop.

This unit is used as woodland, rangeland, wildlife habitat, and watershed.

Broad Land Use Considerations

The soils in this survey area have limited potential for uses other than rangeland. About 0.2 percent of the survey area is used for irrigated crops, mainly alfalfa, alfalfa-grass, pasture, small grain, and corn for silage. The irrigated cropland is in the general areas of Hanksville, Fairview Ranch, Cainville, Notom, Sandy Ranch, King Ranch, and Trachyte. Most of the irrigated cropland is in general soil map units 1 and 10. The main limitation is the shortage of irrigation water late in the growing season. There is potential for storing water from the Fremont River at Cainville and irrigating some additional land at Cainville, Blue Valley, and Hanksville.

About 85 percent of the survey area is used as rangeland. General soil map units 1 through 11 are used mainly for cattle grazing from November to May; however, parts of unit 9, east of Horseshoe Canyon, are used year-round for cattle grazing, and parts of units 1, 3, 4, 5, 6, and 13, in the southwestern part of the survey area, are grazed by sheep and cattle for about 3 months during the winter.

The main limitations for use of these soils as rangeland are the low precipitation and the fact that many of the soils are shallow or sandy and have low available water capacity. Precipitation generally is too low for seeding. Units 12, 13, and 14 are used mainly for summer grazing and for very limited timber production. The main limitations are steepness of slope and shallow soil depth. There are several parcels of land, mainly in map unit 12, that have been cleared and seeded, and there is still some potential for this type of range improvement. Units 13 and 14 have very little potential for range improvement other than by management because of the steepness of slope. Precipitation is adequate for seeding in these units.

The potential for recreation is limited to a small area. About 15 percent of the area, parts of general soil map units 5, 6, 7, 9, 10, and 11, are in the Glen Canyon National Recreation Area and Canyonlands National Park. Except for the Bullfrog Basin and Hite areas, access to the other parks and recreation areas is poor. Units 13 and 14, which are the higher parts of the Henry Mountains, have fair potential for big game hunting and camping. Parts of units, 3, 5, 10, 11, and 12 have potential for recreation and buffalo hunting.

The potential for use as habitat for deer is good in units 12, 13, and 14. Parts of units 3, 5, 10, 11, and 12 are now used by buffalo. Most of the survey area, with the exception of units 6, 7, 13, and 14, have good potential for buffalo habitat. Units 6 and 7 have good potential for goat and bighorn sheep habitat.

Detailed Soil Map Units

The map units delineated on the detailed maps at the back of this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit is given under "Use and Management of the Soils."

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavior divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

Some soils have not been described in adequate detail to place them in a soil series. These soils are classified at the soil family level, which is the next higher level of classification in soil taxonomy. A reference profile is provided to indicate the general characteristics of the soils as they occur in the survey area. Interpretations for the uses of these soils are broader than those made for a soil series. An example of a soil family map unit is Glenberg family.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation to precisely define and locate the soils and miscellaneous areas is needed.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying layers, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying layers. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Billings silty clay loam is one of several phases in the Billings series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or

miscellaneous areas are somewhat similar in all areas. Mivida-Goblin complex is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Table 3 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Map Unit Descriptions

1—Badland. Badland is steep and very steep, barren areas of shale that are dissected by many intermittent drainageways. Potential runoff and erosion are very high.

Included in this unit are about 15 percent Chipeta silty clay, severely eroded, on side slopes and 5 percent Haverdad silt loam along drainageways. Also included are a few small areas of Rock outcrop.

Badland supports very sparse or no vegetation. The present vegetation on the included soils is wedgeleaf saltbush, mat saltbush, black greasewood, Mormon-tea, and Indian ricegrass.

This unit provides limited habitat for wildlife.

This map unit is in capability subclass VIIIs.

2—Badland-Hanksville complex. This map unit is on dissected slopes and alluvial fans. Slopes are 2 to 15 percent, are convex to concave, and are short. The present vegetation in most areas is mainly very sparse wedgeleaf saltbush. Wedgeleaf saltbush, galleta, and deserttrumpet grow in the valleys. Elevation is 4,800 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 150 to 160 days.

This unit is 60 percent Badland; 25 percent Hanksville gravelly clay loam, 2 to 15 percent slopes; and 15 percent other soils and Rock outcrop.

Included in this unit are about 10 percent Chipeta silty clay and 5 percent Rock outcrop.

Badland consists of steep to very steep, barren areas of shale that are dissected by many intermittent drainageways. Potential runoff and the hazard of erosion are very high.

The Hanksville soil is moderately deep and well drained. It formed in alluvium derived dominantly from shale. Typically, the surface layer is pale yellow gravelly clay loam about 3 inches thick. The underlying material to a depth of 35 inches is light brownish gray clay loam. Weathered shale is at a depth of 35 inches. Depth to shale ranges from 20 to 40 inches. This soil is affected by sodium throughout most of the profile.

Permeability of the Hanksville soil is very slow to the restrictive layer. Available water capacity to the restrictive layer is 4 to 7 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 20 to 40 inches. The organic matter content of the surface layer is about 0.5 percent. Runoff is rapid, and the hazard of water erosion is high.

This unit is used as wildlife habitat and rangeland.

The potential plant community on the Hanksville soil is 25 percent grasses, 15 percent forbs, and 60 percent shrubs. Important plants are galleta, Indian ricegrass, wedgeleaf saltbush, and shadscale.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the alkali condition of the soil.

This map unit is in capability subclass VIIs, nonirrigated. The Hanksville soil is in the Desert Clay range site. Badland is not placed in a range site.

3—Badland-Rock outcrop complex. This map unit is about 70 percent Badland, 15 percent Rock outcrop, and 15 percent included soils.

Badland is steep and very steep, barren areas of shale that are dissected by many intermittent drainageways. Runoff and the hazard of erosion are very high.

Rock outcrop consists of exposed areas of barren or nearly barren bedrock. It occurs mainly as nearly vertical cliffs and ledges.

Included in this unit are about 5 percent Chipeta silty clay, 5 percent Moenkopie fine sandy loam, and 5 percent Neskahi family fine sandy loam in drainageways.

This unit is limited for use by wildlife.

This map unit is in capability subclass VIIIs. It is not placed in a range site.

4—Begay loamy fine sand, 2 to 8 percent slopes. This very deep, well drained soil is on broad benches, on mesas, and in valleys. It formed in alluvial and eolian deposits derived dominantly from sandstone. Slopes are undulating and are medium in length. The present vegetation in most areas is mainly needleandthread, galleta, Indian ricegrass, and Mormon-tea. Elevation is 5,000 to 6,300 feet. The average annual precipitation is about 8 to 11 inches, the average annual air temperature is 47 to 52 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is reddish brown loamy fine sand about 5 inches thick. The subsoil is reddish brown very fine sandy loam about 7 inches thick. The upper 24 inches of the substratum is reddish yellow fine sandy

loam, and the lower part to a depth of 60 inches or more is light reddish brown fine sandy loam.

Included in this unit are about 10 percent Mido loamy fine sand and 5 percent Milok loamy fine sand on ridges.

Permeability of this Begay soil is moderately rapid. Available water capacity is about 7.5 to 10.5 inches. Water supplying capacity is 5 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 3 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are Indian ricegrass, needleandthread, fourwing saltbush, and winterfat.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is poor at the higher elevations and very poor at the lower elevations. The main limitations are low precipitation and the sandy texture of the surface layer. Undesirable plants can be controlled by spraying with chemicals, chaining, or plowing. Drilling of seed is preferable and results in better stands of forage. If broadcast seeding is used, it is a good practice to cover the seed by pulling a Dixie harrow, anchor chain, or other similar equipment over the area. Plants other than native species that are suitable for seeding include Siberian wheatgrass, crested wheatgrass, Russian wildrye, fourwing saltbush, and winterfat.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Semidesert Sandy Loam range site.

5—Begay fine sandy loam, 2 to 8 percent slopes. This very deep, well drained soil is on alluvial fans, on hills, and in small valleys. It formed in alluvium derived dominantly from sandstone. Slopes are convex to concave and are medium in length. The present vegetation in most areas is mainly Indian ricegrass, needleandthread, Mormon-tea, broom snakeweed, and galleta. Elevation is 5,200 to 6,400 feet. The average annual precipitation is about 8 to 11 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is yellowish red fine sandy loam about 3 inches thick. The subsoil is yellowish red fine sandy loam about 11 inches thick. The upper 16 inches of the substratum is reddish brown fine sandy loam, and the lower part to a depth of 60 inches or more is pink loamy fine sand.

Included in this unit are about 10 percent soils that are similar to this Begay soil but are moderately deep over sandstone, 5 percent Mido loamy fine sand, and 10 percent Yarts fine sandy loam.

Permeability of the Begay soil is moderately rapid. Available water capacity is about 6.5 to 10.0 inches. Water supplying capacity is 5 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 3 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

The potential plant community is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are Indian ricegrass, needleandthread, fourwing saltbush, and winterfat.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is poor at the higher elevations and very poor at the lower elevations. The main limitation is low precipitation. Undesirable plants can be controlled by spraying with chemicals, chaining, or plowing. Drilling of seed results in better stands of forage. If broadcast seeding is used, it is a good practice to cover the seed by pulling a Dixie harrow, anchor chain, or other similar equipment over the area. Plants other than native species that are suitable for seeding include Siberian wheatgrass, crested wheatgrass, Russian wildrye, fourwing saltbush, and winterfat.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Semidesert Sandy Loam range site.

6—Begay-Mellenthin complex. This map unit is on rolling hills, alluvial fans, and ridges. The Begay soil is on hillsides and fans, and the Mellenthin soil is on ridges. Slopes are 2 to 30 percent, are concave to convex, and are medium in length. The present vegetation in most areas is mainly Indian ricegrass, needleandthread, galleta, Mormon-tea, Utah juniper, and pinyon. The Utah juniper and pinyon grow mainly on the Mellenthin soil. Elevation is 5,800 to 6,400 feet. The average annual precipitation is about 8 to 11 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 60 percent Begay loamy fine sand, 2 to 8 percent slopes; 20 percent Mellenthin gravelly fine sandy loam, 4 to 30 percent slopes, eroded; and 20 percent other soils and Rock outcrop.

Included in this unit are about 10 percent Mido loamy fine sand, 5 percent Rock outcrop, and 5 percent Yarts fine sandy loam in drainageways.

The Begay soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone. Typically, the surface layer is yellowish red loamy fine sand about 3 inches thick. The subsoil is yellowish red fine sandy loam about 11 inches thick. The upper 31 inches of the substratum is reddish yellow fine sandy loam, and the lower part to a depth of 60 inches or more is pink loamy fine sand.

Permeability of the Begay soil is moderately rapid. Available water capacity is about 6.0 to 9.5 inches. Water supplying capacity is 5 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Mellenthin soil is shallow and well drained. It formed in residuum derived dominantly from sandstone. Typically, the surface layer is reddish yellow gravelly fine sandy loam about 3 inches thick. The underlying material to a depth of 16 inches is reddish brown very channery fine sandy loam. Sandstone is at a depth of 16 inches. Depth to sandstone ranges from 10 to 20 inches. A layer of calcium carbonate accumulation is at a depth of 3 to 8 inches.

Permeability of the Mellenthin soil is moderate to the restrictive layer. Available water capacity is 1 inch to 2 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used as rangeland, wildlife habitat, and woodland.

The potential plant community on the Begay soil is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are Indian ricegrass, needleandthread, fourwing saltbush, and winterfat.

The potential plant community on the Mellenthin soil is 35 percent grasses, 20 percent forbs, and 45 percent shrubs. Important understory plants are galleta, Indian ricegrass, shadscale, Mormon-tea, and fourwing saltbush. The overstory is Utah juniper and pinyon.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, a high hazard of soil blowing on the Begay soil, and the shallow depth of the Mellenthin soil.

This map unit is in capability subclass VIIe, nonirrigated. The Begay soil is in the Semidesert Sandy Loam range site, and the Mellenthin soil is in the Semidesert Shallow Sand (Juniper-Pinyon) woodland site.

7—Begay-Mido complex. This map unit is on alluvial fans. Slopes are 2 to 15 percent and are short. The present vegetation in most areas is mainly Mormon-tea, Indian ricegrass, needleandthread, and galleta. Elevation is 5,200 to 6,000 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 50 percent Begay loamy fine sand, 2 to 8 percent slopes, severely eroded; 40 percent Mido loamy fine sand, dry, 4 to 15 percent slopes, severely eroded; and 10 percent other soils.

Included in this unit are about 5 percent Bowdish loamy fine sand near canyon walls and 5 percent Yarts loamy fine sand in drainageways.

The Begay soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone. Typically, the surface layer is yellowish red loamy fine sand about 3 inches thick. The subsoil is yellowish red fine sandy loam about 11 inches thick. The upper 31 inches of the substratum is reddish yellow fine sandy loam, and the lower part to a depth of 60 inches or more is pink loamy fine sand.

Permeability of the Begay soil is moderately rapid. Available water capacity is about 6.0 to 9.5 inches. Water supplying capacity is 5 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Mido soil is very deep and excessively drained. It formed in eolian deposits derived dominantly from sandstone. Typically, the profile is reddish brown loamy fine sand to a depth of 60 inches or more.

Permeability of the Mido soil is rapid. Available water capacity is about 3.5 to 6.0 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.5 percent. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Begay soil is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are Indian ricegrass, needleandthread, fourwing saltbush, and winterfat.

The potential plant community on the Mido soil is 50 percent grasses, 20 percent forbs, and 30 percent shrubs. Important plants are Indian ricegrass, galleta, needleandthread, fourwing saltbush, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the sandy texture of the Mido soil.

This map unit is in capability subclass VIIe, nonirrigated. The Begay soil is in the Semidesert Sandy Loam range site, and the Mido soil is in the Semidesert Sand range site.

8—Begay-Rizno complex. This map unit is on mesas, benches, and ridges. Slopes are 2 to 15 percent, are convex to concave, and are medium in length. The present vegetation in most areas is mainly Indian ricegrass, Mormon-tea, galleta, and broom snakeweed. Elevation is 5,000 to 5,600 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 60 percent Begay loamy fine sand, 2 to 8 percent slopes, eroded; 30 percent Rizno fine sandy loam, 4 to 15 percent slopes, eroded; and 10 percent other soils and Rock outcrop.

Included in this unit are about 5 percent Rock outcrop and 5 percent shallow soils adjacent to the Rock outcrop.

The Begay soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone. Typically, the surface layer is yellowish red loamy fine sand about 3 inches thick. The subsoil is reddish yellow fine sandy loam about 17 inches thick. The substratum to a depth of 60 inches or more is reddish yellow fine sandy loam.

Permeability of the Begay soil is moderately rapid. Available water capacity is about 6.0 to 9.5 inches. Water supplying capacity is 5 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Rizno soil is shallow and well drained. It formed in residuum derived dominantly from sandstone. Typically, the surface layer is light reddish brown fine sandy loam about 3 inches thick. The underlying material to a depth of 17 inches is light reddish brown fine sandy loam. Sandstone is at a depth of 17 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Rizno soil is moderately rapid to the restrictive layer. Available water capacity is about 1.5 to 2.0 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Begay soil is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are Indian ricegrass, needleandthread, fourwing saltbush, and winterfat.

The potential plant community on the Rizno soil is 35 percent grasses, 20 percent forbs, and 45 percent shrubs. Important plants are galleta, Mormon-tea, Indian ricegrass, shadscale, and Bigelow sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow depth of the Rizno soil.

This map unit is in capability subclass VIIe, nonirrigated. The Begay soil is in the Semidesert Sandy Loam range site, and the Rizno soil is in the Semidesert Shallow Sandy Loam range site.

9—Billings silt loam. This very deep, well drained soil is on alluvial fans and flood plains (fig. 1). It formed in alluvium derived dominantly from shale. Slopes are 0 to 4 percent and are medium in length. They are dissected by gullies. The present vegetation in most areas is mainly greasewood, green molly, seepweed, and bottlebrush squirreltail. Elevation is 4,300 to 4,800 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 145 to 155 days.

Typically, the surface layer is light brownish gray silt loam about 1 inch thick. The underlying material to a depth of 60 inches or more is grayish brown silty clay loam. Stratification is common below a depth of about 40 inches. This soil is affected by sodium throughout most of the profile and is moderately saline to strongly saline.

Included in this unit is about 10 percent Hanksville clay loam, eroded, and Trail loam.

Permeability of the Billings soil is slow. Available water capacity is about 4.5 to 9.0 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

The potential plant community is 40 percent grasses, 20 percent forbs, and 40 percent shrubs. Important

Figure 1.—Typical area of Billings silt loam. Area of Badland in background.

plants are galleta, bottlebrush squirreltail, alkali sacaton, and black greasewood.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the content of sodium in the soils.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Alkali Flat range site.

10—Billings silty clay loam. This very deep, well drained soil is in alluvial valleys. It is in areas along the Fremont River, east of Caineville. It formed in alluvium derived dominantly from shale and sandstone. Slopes are are 1 to 2 percent and are medium in length. Elevation is 4,250 to 4,700 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 53 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is moderately alkaline, light brownish gray silty clay loam about 5 inches thick. The underlying material to a depth of 60 inches or more is moderately alkaline, grayish brown silty clay loam.

Included in this unit are about 15 percent Jocity loam and some small areas of saline soils.

Permeability of this Billings soil is slow. Available water capacity is about 9 to 11 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used for irrigated crops and as wildlife habitat.

The main crops grown are alfalfa, alfalfa-grass, small grain, and corn for silage. A suitable crop rotation consists of alfalfa or alfalfa-grass, corn for silage, and small grain. The grain and corn should not be grown more than 30 percent of the rotation time. Fall plowing and minimum tillage are needed. Use of crop residue and commercial fertilizer maintains good soil tilth and fertility. Weed control by mechanical or chemical means is essential to maintain good production and a favorable plant community.

Furrow, border, corrugation, and sprinkler irrigation systems are suited to this unit. Water should be applied in amounts sufficient to wet the root zone but in amounts small enough to minimize the leaching of plant nutrients. Grazing when the soil is moist results in compaction of the surface layer, poor tilth, and excessive runoff.

When irrigated, this soil is capable of producing about 6 tons of alfalfa hay, 2 tons of corn for silage, 100 bushels of barley, or 80 bushels of spring wheat per acre, or it can produce 11 animal-unit-months of pasture per acre.

This map unit is in capability unit IIIs-15, irrigated.

11—Billings silty clay loam, saline-alkali. This very deep, well drained soil is in alluvial valleys. It is in Blue Valley, between Caineville and Hanksville. It formed in alluvium derived dominantly from shale and sandstone. Slopes are 1 to 2 percent and are long. The present vegetation in most areas is mainly greasewood, annual forbs, and bottlebrush squirreltail. Elevation is 4,300 to 4,700 feet. The average annual precipitation is about 5 to 7 inches, the average annual air temperature is 51 to 53 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is light brownish gray silty clay loam about 6 inches thick. The underlying material to a depth of 60 inches or more is dominantly grayish brown silty clay loam, but it is stratified with silt loam and a thin lens of clay loam. This soil is affected by sodium throughout most of the profile and is strongly saline.

Included in this unit is about 10 percent Billings silty clay loam, Jocity loam, and Trachute loamy fine sand.

Permeability of this Billings soil is slow. Available water capacity is about 4.5 to 9.0 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 40 percent grasses, 20 percent forbs, and 40 percent shrubs. Important plants are galleta, alkali sacaton, black greasewood, and bottlebrush squirreltail.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the saline-alkali condition of the soil.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Alkali Flat range site.

12—Billings Variant clay. This very deep, well drained soil is on alluvial fans in the Hanksville and Caineville areas. It formed in alluvium derived dominantly from shale. Slopes are 1 to 2 percent and are long. Elevation is 4,250 to 4,700 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 53 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is brown, moderately alkaline clay about 8 inches thick. The upper 6 inches of the underlying material is brown, moderately alkaline clay, and the lower part to a depth of 60 inches or more is grayish brown and brown, strongly alkaline clay.

Included in this unit is about 10 percent Billings silty clay loam. Also included are small areas of a soil that is similar to this Billings Variant soil but is light reddish brown below a depth of about 40 inches and in some pedons is sandy loam.

Permeability of this Billings Variant soil is slow. Available water capacity is about 10 to 12 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight.

This unit is used as irrigated cropland and wildlife habitat.

The main crops grown are alfalfa, alfalfa-grass, small grain, and corn for silage. A suitable crop rotation consists of alfalfa or alfalfa-grass, corn for silage, and small grain. The grain and corn should not be grown more than 30 percent of the rotation time. The main limitation is the clayey texture of the soil. Fall plowing and minimum tillage are needed. Use of crop residue and commercial fertilizer maintains good soil tilth and fertility. Weed control by mechanical or chemical means is essential to maintain good production and a favorable plant community.

Furrow, border corrugation, and sprinkler irrigation systems are suited to this unit. Water should be applied in amounts sufficient to wet the root zone but in amounts small enough to minimize the leaching of plant nutrients. Water needs to be applied at a slow rate over a long period to ensure that the root zone is properly wetted. Grazing when the soil is moist results in compaction of the surface layer, poor tilth, and excessive runoff.

If irrigated, this unit can produce about 5 tons of alfalfa hay or 15 tons of corn silage per acre.

This map unit is in capability unit IIIs-15, irrigated.

13—Blackston fine sandy loam. This very deep, well drained soil is on upland terraces. It formed in alluvium derived dominantly from diorite. Slopes are 2 to 4 percent and are long. The present vegetation in most areas is mainly galleta, sand dropseed, blackbrush, shadscale, and Mormon-tea. Elevation is 4,500 to 5,200 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 48 to 52 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The upper 22 inches of the underlying material is pale brown very cobbly clay loam, and the lower part to a depth of 60 inches or more is pale brown extremely cobbly loamy sand. A layer of calcium carbonate accumulation is at a depth of 4 to 8 inches. In irrigated areas the surface layer is clay loam.

Included in this unit are small areas of Moffat loamy fine sand, Pastern cobbly fine sandy loam, and Sheppard loamy fine sand.

Permeability of this Blackston soil is moderate to a depth of 36 inches and rapid below this depth. Available water capacity is about 3 to 6 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used as rangeland, irrigated cropland, and wildlife habitat.

The potential plant community is 29 percent grasses, 14 percent forbs, and 57 percent shrubs. Important plants are galleta, blackbrush, shadscale, and Torrey Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the droughtiness of the soil.

The main limitations for irrigated crops are the droughtiness of the soil and inadequate supply of water in some years.

The main crops grown are alfalfa, alfalfa-grass, small grain, and corn for silage. A suitable crop rotation consists of alfalfa or alfalfa-grass, corn for silage, and small grain. The grain and corn should not be grown more than 30 percent of the rotation time. Fall plowing and minimum tillage are needed. Use of crop residue and commercial fertilizer maintains good soil tilth and fertility. Weed control by mechanical or chemical means is essential to maintain good production and a favorable plant community. Sprinkler irrigation is the most suitable method of applying water. Use of this method permits the even, controlled application of water, reduces runoff, and minimizes the risk of erosion. If furrow irrigation is used, water should be applied at frequent intervals and runs should be short. Water should be applied in amounts sufficient to wet the root zone but in amounts small enough to minimize the leaching of plant nutrients. Grazing when the soil is moist results in compaction of the surface layer, poor tilth, and excessive runoff.

If irrigated, this unit can produce about 6 tons of alfalfa hay, 2 tons of corn silage, 100 bushels of barley, or 80 bushels of spring wheat per acre, or it can produce 11 animal-unit-months of pasture per acre.

This map unit is in capability unit IIIs-14, irrigated, and capability subclass VIIs, nonirrigated. It is in the Desert Stony Loam (Blackbrush) range site. The soil in this unit, where irrigated, is prime farmland.

14—Blackston gravelly fine sandy loam, 4 to 8 percent slopes. This very deep, well drained soil is on upland terraces. It formed in alluvium derived dominantly from diorite. Slopes are undulating and long. The present vegetation in most areas is mainly galleta, Indian ricegrass, shadscale, and broom snakeweed. Elevation is 4,700 to 5,200 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 48 to 52 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is brown gravelly fine sandy loam about 4 inches thick. The upper 21 inches of the underlying material is light brown or pale brown very cobbly clay loam, and the lower part to a depth of 60 inches or more is very pale brown extremely cobbly loamy sand. A layer of calcium carbonate accumulation is at a depth of 4 to 8 inches.

Included in this unit are about 10 percent Leebench gravelly clay loam and 5 percent soils that are similar to this Blackston soil but have a cobbly loam surface layer and are redder.

Permeability of this Blackston soil is moderate to a depth of 25 inches and rapid below this depth. Available water capacity is about 3.0 to 5.5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content

of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is slight.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 30 percent grasses, 15 percent forbs, and 55 percent shrubs. Important plants are galleta, Indian ricegrass, bud sagebrush, shadscale, and Bigelow sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the droughtiness of the soil.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Desert Stony Loam range site.

15—Blackston gravelly fine sandy loam, 8 to 30 percent slopes. This very deep, well drained soil is on upland terraces and rolling hills. It formed in alluvium derived dominantly from diorite and sandstone. Slopes are concave to convex and are medium in length. The present vegetation in most areas is mainly blackbrush, shadscale, broom snakeweed, Mormon-tea, and galleta. Elevation is 4,500 to 5,200 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 48 to 52 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is brown gravelly fine sandy loam about 4 inches thick. The upper 21 inches of the underlying material is pale brown very cobbly clay loam, and the lower part to a depth of 60 inches or more is pale brown extremely cobbly loamy sand. A layer of calcium carbonate accumulation is at a depth of 4 to 8 inches.

Included in this unit are about 10 percent of Moenkopie fine sandy loam, 5 percent Rock outcrop, and 5 percent Sheppard loamy fine sand.

Permeability of this Blackston soil is moderate to a depth of 25 inches and rapid below this depth. Available water capacity is about 3.0 to 5.5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 29 percent grasses, 14 percent forbs, and 57 percent shrubs. Important plants are galleta, blackbrush, shadscale, and Torrey Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the droughtiness of the soil.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Desert Stony Loam (Blackbrush) range site.

16—Blackston-Leebench complex. This map unit is on upland terraces and fan terraces. The Blackston soil is on convex slopes, and the Leebench soil is on the more nearly level, concave slopes. Slopes are 2 to 8 percent, are concave to convex, and are medium in length. The present vegetation in most areas is mainly shadscale, galleta, deserttrumpet, and locoweed. Elevation is 4,800 to 5,200 feet. The average annual precipitation is about 6 to 8 inches, the average annual air temperature is 48 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 50 percent Blackston gravelly fine sandy loam, 4 to 8 percent slopes; 30 percent Leebench fine sandy loam, 2 to 8 percent slopes; and 20 percent other soils.

Included in this unit are about 10 percent Moffat loamy fine sand, 5 percent Moenkopie channery sandy loam, and 5 percent Sheppard loamy fine sand.

The Blackston soil is very deep and well drained. It formed in alluvium derived dominantly from diorite and sandstone. Typically, the surface layer is brown gravelly fine sandy loam about 4 inches thick. The upper 21 inches of the underlying material is pale brown very cobbly loam, and the lower part to a depth of 60 inches or more is white extremely cobbly loamy sand.

Permeability of the Blackston soil is moderate to a depth of 25 inches and very rapid below this depth. Available water capacity is about 3.0 to 5.5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Leebench soil is very deep and well drained. If formed in alluvium derived dominantly from diorite and sandstone. Typically, the surface layer is light brown fine sandy loam about 3 inches thick. The subsoil is brown, very strongly alkaline clay loam about 22 inches thick. The upper 17 inches of the substratum is light brown gravelly clay loam, and the lower part to a depth of 60 inches or more is light yellowish brown extremely gravelly sandy loam. This soil is affected by sodium

throughout most of the profile. A layer of calcium carbonate accumulation is between depths of 10 and 42 inches.

Permeability of the Leebench soil is slow to a depth of 42 inches and rapid below this depth. Available water capacity is about 5 to 8 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Blackston soil is 30 percent grasses, 15 percent forbs, and 55 percent shrubs. Important plants are galleta, Indian ricegrass, bud sagebrush, shadscale, and Bigelow sagebrush.

The potential plant community on the Leebench soil is 25 percent grasses, 25 percent forbs, and 50 percent shrubs. Important plants are galleta, Indian ricegrass, globemallow, deserttrumpet, wedgeleaf saltbush, and bud sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are the low precipitation and the alkali condition of the Leebench soil.

This map unit is in capability subclass VIIe, nonirrigated. The Blackston soil is in the Desert Stony Loam range site, and the Leebench soil is in the Alkali Fan range site.

17—Bowdish loamy fine sand, 4 to 8 percent slopes. This moderately deep, well drained soil is on mesas and benches. It formed in residuum and local alluvium derived dominantly from sandstone and siltstone. Slopes are long. The present vegetation in most areas is mainly blackbrush, galleta, Indian ricegrass, and Mormon-tea. Elevation is 5,000 to 5,600 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is yellowish red loamy fine sand about 2 inches thick. The subsoil is yellowish red sandy loam about 5 inches thick. The upper 12 inches of the substratum is red sandy loam, and the lower part to a depth of 30 inches is red channery loam. Soft siltstone is at a depth of 30 inches. A layer of calcium carbonate accumulation is at a depth of 6 to 15 inches. Depth to siltstone ranges from 20 to 40 inches.

Included in this unit is about 10 percent Mido loamy fine sand in slightly depressional areas and on the lee side of the slopes.

Permeability of the Bowdish soil is moderate to the restrictive layer. Available water capacity is about 3.5 to 4.5 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 20 to 40 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 45 percent grasses, 40 percent forbs, and 15 percent shrubs. Important plants are Indian ricegrass, needleandthread, galleta, sand dropseed, fourwing saltbush, blackbrush, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Semidesert Sandy Loam (Blackbrush) range site.

18—Bowdish-Mido complex. This map unit is on mesas and benches. Slopes are 2 to 4 percent and are long. The present vegetation in most areas is mainly blackbrush, Mormon-tea, galleta, Indian ricegrass, and yucca. The blackbrush is mostly on the Bowdish soil. Elevation is 5,000 to 5,600 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 60 percent Bowdish loamy fine sand, 2 to 4 percent slopes; 35 percent Mido loamy fine sand, dry, hummocky, 2 to 4 percent slopes; and 5 percent other soils.

Included in this unit are 3 percent Begay fine sandy loam and 2 percent Pastern cobbly fine sandy loam.

The Bowdish soil is moderately deep and well drained. It formed in residuum and local alluvium derived dominantly from sandstone and siltstone. Typically, the surface layer is yellowish red loamy fine sand about 4 inches thick. The subsoil is yellowish red sandy loam about 6 inches thick. The upper 25 inches of the substratum is pink loam, and the lower part to a depth of 39 inches is pink channery loam. Soft sandstone or siltstone is at a depth of 39 inches. A layer of calcium carbonate accumulation is at a depth of 6 to 15 inches. Depth to sandstone ranges from 20 to 40 inches.

Permeability of the Bowdish soil is moderate to the restrictive layer. Available water capacity is 3.5 to 5.0 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 20 to 40 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Mido soil is very deep and excessively drained. It formed in eolian deposits derived dominantly from sandstone. Typically, the profile is reddish yellow loamy fine sand to a depth of 60 inches or more.

Permeability of the Mido soil is rapid. Available water capacity is about 3.5 to 6.0 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 percent. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Bowdish soil is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are Indian ricegrass, needleandthread, galleta, sand dropseed, fourwing saltbush, blackbrush, and Mormon-tea.

The potential plant community on the Mido soil is 50 percent grasses, 20 percent forbs, and 30 percent shrubs. Important plants are galleta, dropseed, Indian ricegrass, needleandthread, Mormon-tea, and fourwing saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the sandy texture of the Mido soil.

This map unit is in capability subclass VIIe, nonirrigated. The Bowdish soil is in the Semidesert Sandy Loam (Blackbrush) range site, and the Mido soil is in the Semidesert Sand range site.

19—Bowdish Variant fine sandy loam. This deep, well drained soil is on mesas. It formed in residuum derived dominantly from shale and sandstone. Slopes are 2 to 4 percent and are medium in length. The present vegetation in most areas is mainly Indian ricegrass, shadscale, galleta, broom snakeweed, and winterfat. Elevation is 4,900 to 6,000 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is light brown fine sandy loam about 3 inches thick. The underlying material to a depth of 44 inches is light brown loam. Sandstone is at a depth of 44 inches. Depth to sandstone ranges from 40 to 60 inches. A layer of calcium carbonate accumulation is at a depth of 3 to 32 inches.

Included in this unit are about 15 percent Travessilla fine sandy loam and small areas of Rock outcrop.

Permeability of the Bowdish Variant soil is moderate to the restrictive layer. Available water capacity is about 6 to 8 inches. Water supplying capacity is 5 to 8 inches. Effective rooting depth is 40 to 60 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are Indian ricegrass, fourwing saltbush, winterfat, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Semidesert Sandy Loam range site.

20—Canyon family-Rock outcrop complex. This map unit is on hillsides and mountainsides. Slopes are 4 to 70 percent. They are convex and long. The present vegetation in most areas is mainly Mormon-tea, broom snakeweed, roundleaf buffaloberry, littleleaf mountainmahogany, and some pinyon and Utah juniper. Elevation is 6,000 to 7,900 feet. The average annual precipitation is about 8 to 12 inches, the average annual air temperature is 45 to 50 degrees F, and the freeze-free period is 120 to 140 days.

This unit is 50 percent Canyon family soils, 4 to 70 percent slopes; 40 percent Rock outcrop; and 10 percent other soils.

Included in this unit is about 10 percent Rizno channery fine sandy loam.

The Canyon family soils are shallow and well drained. They formed in alluvium and residuum derived dominantly from shale and igneous rock. No single profile is typical of the Canyon family soils, but one commonly observed in the survey area has a reddish brown very stony loam surface layer about 4 inches thick. The underlying material to a depth of 18 inches is light yellowish brown clay loam. Shale is at a depth of 18 inches. Depth to shale ranges from 5 to 20 inches.

Permeability of the Canyon family soils is moderately slow to the restrictive layer. Available water capacity is about 2 to 4 inches. Water supplying capacity is 2 inches. Effective rooting depth is 5 to 20 inches. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is rapid, and the hazard of water erosion is high.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used mainly as wildlife habitat. It is also used as rangeland.

The potential plant community on the Canyon family soils is 30 percent grasses, 15 percent forbs, and 55 percent shrubs. Important plants are needleandthread, Bigelow sagebrush, shadscale, littleleaf mountainmahogany, and Utah juniper.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are shallow soil depth, steepness of slope in some areas, the very stony surface layer, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Canyon family soils are in the Semidesert Very Shallow Sandy Loam range site. Rock outcrop is not placed in a range site.

21—Cerrillos-Chipeta complex. This map unit is on dissected alluvial fans and benches. Slopes are 2 to 15 percent, are convex to concave, and are medium in length. The present vegetation in most areas is mainly blackbrush, Mormon-tea, fourwing saltbush, galleta, and Indian ricegrass. Elevation is 5,500 to 6,000 feet. The average annual precipitation is about 8 to 11 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 70 percent Cerrillos cobbly loam, 4 to 15 percent slopes; 20 percent Chipeta silty clay, 2 to 15 percent slopes; and 10 percent other soils.

Included in this unit is about 10 percent Strych gravelly fine sandy loam.

The Cerrillos soil is very deep and well drained. It formed in alluvium derived dominantly from shale. Typically, the surface layer is reddish brown cobbly loam about 4 inches thick. The subsoil is reddish brown clay loam about 7 inches thick. The upper 14 inches of the substratum is pinkish white, weakly cemented clay loam, and the lower part to a depth of 60 inches or more is pinkish white clay loam. A layer of calcium carbonate accumulation is at a depth of 11 to 18 inches.

Permeability of the Cerrillos soil is moderately slow. Available water capacity is about 10 to 12 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate.

The Chipeta soil is shallow and well drained. It formed in residuum derived dominantly from shale. Typically, the surface layer is light olive brown silty clay about 1 inch thick. The underlying material to a depth of 19 inches is light olive brown silty clay loam. Shale is at a depth of 19 inches. Depth to shale ranges from 10 to 20 inches.

Permeability of the Chipeta soil is slow to the restrictive layer. Available water capacity is about 2.0 to 3.5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Cerrillos soil is 40 percent grasses, 10 percent forbs, and 50 percent shrubs. Important plants are Indian ricegrass, blue grama, blackbrush, and Mormon-tea.

The potential plant community on the Chipeta soil is 20 percent grasses, 20 percent forbs, and 60 percent shrubs. Important plants are mat saltbush, galleta, Indian ricegrass, and deserttrumpet.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIe, nonirrigated. The Cerrillos soil is in the Semidesert Stony Loam (Blackbrush) range site, and the Chipeta soil is in the Desert Shallow Clay range site.

22—Cerrillos Variant loam. This moderately deep, well drained soil is on alluvial fans. It formed in alluvium derived dominantly from shale and sandstone. Slopes are 2 to 4 percent and are long. The present vegetation in most areas is mainly galleta, Indian ricegrass, and shadscale. Elevation is 4,800 to 4,900 feet. The average annual precipitation is about 6 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is light brownish gray loam about 2 inches thick. The subsoil is brown clay loam about 22 inches thick. The substratum to a depth of 36 inches is very pale brown loam. Sandstone is at a depth of 36 inches. A layer of calcium carbonate accumulation

is at a depth of 10 to 17 inches. Depth to sandstone ranges from 20 to 40 inches.

Included in this unit is about 5 percent Neskahi family fine sandy loam that has slopes of 0 to 4 percent and is in drainageways.

Permeability of this Cerrillos Variant soil is moderately slow to the restrictive layer. Available water capacity is about 5.0 to 7.5 inches. Water supplying capacity is 3 to 4 inches. Effective rooting depth is 20 to 40 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 35 percent grasses, 10 percent forbs, and 55 percent shrubs. Important plants are galleta, Indian ricegrass, bottlebrush squirreltail, deserttrumpet, shadscale, bud sagebrush, and gray molly.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Desert Loam range site.

23—Chipeta silty clay, 2 to 15 percent slopes. This shallow, well drained soil is on rolling low hills and knolls. It formed in residuum derived dominantly from shale. Slopes are convex to concave and are short. The present vegetation in most areas is mainly mat saltbush and deserttrumpet. Elevation is 4,500 to 6,000 feet. The average annual precipitation is about 5 to 10 inches, the average annual air temperature is 48 to 52 degrees F, and the freeze-free period is 120 to 160 days.

Typically, the surface layer is light olive brown silty clay about 1 inch thick. The underlying material to a depth of 19 inches is light olive brown silty clay loam. Shale is at a depth of 19 inches. Depth to shale ranges from 10 to 20 inches.

Included in this unit are about 10 percent Badland and 5 percent Hanksville clay loam.

Permeability of the Chipeta soil is slow to the restrictive layer. Available water capacity is about 2.0 to 3.5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 20 percent grasses, 20 percent forbs, and 60 percent shrubs. Important plants are mat saltbush, galleta, Indian ricegrass, and deserttrumpet.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and shallow soil depth.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Desert Shallow Clay range site.

24—Chipeta gravelly silty clay, 30 to 60 percent slopes. This shallow, well drained soil is on side slopes of mesas and benches. It formed in residuum and colluvium derived dominantly from shale. Slopes are convex to concave and are short. The present vegetation in most areas is mainly mat saltbush and deserttrumpet. Elevation is 5,000 to 6,000 feet. The average annual precipitation is about 6 to 10 inches, the average annual air temperature is 48 to 52 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is light brownish gray gravelly silty clay about 3 inches thick. The underlying material to a depth of 15 inches is light olive brown silty clay loam. Shale is at a depth of 15 inches. Depth to shale ranges from 10 to 20 inches.

Included in this unit is about 10 percent Chipeta silty clay.

Permeability of this Chipeta soil is slow to the restrictive layer. Available water capacity is about 1.5 to 3.0 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is very rapid, and the hazard of water erosion is very high.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 20 percent grasses, 20 percent forbs, and 60 percent shrubs. Important plants are mat saltbush, galleta, Indian ricegrass, and deserttrumpet.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Because of the steepness of slope, grazing should be carefully managed to prevent overgrazing, which results in excessive soil erosion. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for

seeding is very poor. The main limitations are low precipitation, shallow depth of the soil, and steepness of slope.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Desert Shallow Clay range site.

25—Chipeta-Badland complex. This map unit is on dissected benches, mesas, and side slopes. Slopes are 2 to 30 percent, are convex to concave, and are short. The present vegetation in most areas is mat saltbush, galleta, and Indian ricegrass. Elevation is 4,500 to 6,000 feet. The average annual precipitation is about 6 to 10 inches, the average annual air temperature is 48 to 52 degrees F, and the freeze-free period is 120 to 160 days.

This unit is 60 percent Chipeta gravelly silty clay, 2 to 30 percent slopes, and 35 percent Badland.

Included in this unit is about 5 percent Hanksville clay loam.

The Chipeta soil is shallow and well drained. It formed in residuum derived dominantly from shale. Typically, the surface layer is light brownish gray gravelly silty clay about 3 inches thick. The underlying material to a depth of 12 inches is light olive brown silty clay loam. Shale is at a depth of 12 inches. Depth to shale ranges from 10 to 20 inches.

Permeability of the Chipeta soil is slow to the restrictive layer. Available water capacity is 1 inch to 2 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is very rapid, and the hazard of water erosion is very high.

Badland is steep and very steep, barren areas of shale that are dissected by many intermittent drainageways. Potential runoff is very rapid, and the hazard of erosion are very high.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Chipeta soil is 20 percent grasses, 20 percent forbs, and 60 percent shrubs. Important plants are mat saltbush, galleta, Indian ricegrass, and deserttrumpet.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, shallow soil depth, and the areas of Badland.

This map unit is in capability subclass VIIs, nonirrigated. The Chipeta soil is in the Desert Shallow Clay range site. Badland is not placed in a range site.

26—Chipeta Variant-Badland-Rock outcrop complex. This map unit is on canyon foot slopes. Slopes are 15 to 40 percent, are convex to concave, and are short. The present vegetation in most areas is mainly galleta, shadscale, and yellowbrush. Elevation is 6,000 to 6,600 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 48 to 50 degrees F, and the freeze-free period is 120 to 140 days.

This unit is 30 percent Chipeta Variant clay loam, 15 to 40 percent slopes; 30 percent Badland; 25 percent Rock outcrop; and 15 percent other soils.

Included in this unit is about 15 percent Chipeta gravelly silty clay.

The Chipeta Variant soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from shale. Typically, the surface layer is pale brown clay loam about 4 inches thick. The upper 5 inches of the underlying material is light brownish gray clay loam, and the lower part to a depth of 22 inches is pale brown cobbly silty clay loam. Weathering shale is at a depth of 22 inches. Depth to shale ranges from 20 to 40 inches.

Permeability of the Chipeta Variant soil is slow to the restrictive layer. Available water capacity is about 2.5 to 4.0 inches. Water supplying capacity is 3 to 5 inches. Effective rooting depth is 20 to 40 inches. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

Badland is steep and very steep, barren areas of shale that are dissected by many intermittent drainageways. Potential runoff is very rapid, and the hazard of erosion is very high.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Chipeta Variant soil is 50 percent grasses, 5 percent forbs, and 45 percent shrubs. Important plants are galleta, shadscale, Torrey Mormon-tea, and wedgeleaf saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Because of the steepness of slope, grazing should be carefully managed to prevent overgrazing, which results in excessive soil erosion. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the areas of Rock outcrop and Badland.

This map unit is in capability subclass VIIe, nonirrigated. The Chipeta soil is in the Desert Shallow Clay (Shadscale) range site. Badland and Rock outcrop are not placed in a range site.

27—Circleville-Blazon complex. This map unit is on upland fans and fan terraces. Slopes are 8 to 30 percent, are concave to convex, and are medium in length. The present vegetation in most areas is mainly pinyon, Utah juniper, sagebrush, Utah serviceberry, birchleaf mountainmahogany, blue grama, and Sandberg bluegrass. The average annual precipitation is about 12 to 15 inches, the average annual air temperature is 40 to 45 degrees F, and the freeze-free period is 75 to 100 days.

This unit is 45 percent Circleville cobbly loam, 8 to 30 percent slopes; 35 percent Blazon cobbly clay loam, 8 to 30 percent slopes; and 20 percent other soils.

Included in this unit are about 10 percent Tolman very cobbly fine sandy loam, 5 percent soils that are similar to the Circleville soil but are very deep, and 5 percent soils that are similar to the Blazon soil but are moderately deep over shale.

The Circleville soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from diorite. Typically, the surface layer is dark grayish brown cobbly loam about 4 inches thick. The subsoil is brown very cobbly clay loam about 8 inches thick. The substratum to a depth of 36 inches is brown very gravelly loam. Bedrock is at a depth of 36 inches. A layer of lime accumulation is at a depth of 10 to 20 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Circleville soil is moderate to the restrictive layer. Available water capacity to the restrictive layer is 3.5 to 4.5 inches. Water supplying capacity is 6 inches. Effective rooting depth is 20 to 40 inches. The organic matter content of the surface layer is about 3 to 6 percent. Runoff is medium, and the hazard of water erosion is moderate.

The Blazon soil is shallow and well drained. It formed in residuum and alluvium derived dominantly from shale. Typically, the surface layer is grayish brown cobbly clay loam about 4 inches thick. The underlying material to a depth of 11 inches is brown clay loam. Shale is at a depth of 11 inches. Depth to shale ranges from 10 to 20 inches.

Permeability of the Blazon soil is moderately slow to the restrictive layer. Available water capacity to the restrictive layer is 1.5 to 2.0 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 2 to 4 percent. Runoff is medium, and the hazard of water erosion is moderate.

This unit is used as rangeland, woodland, and wildlife habitat.

The potential plant community on the Circleville soil is 65 percent grasses, 10 percent forbs, and 25 percent shrubs. Important plants are muttongrass, Nevada bluegrass, Wyoming big sagebrush, and green Mormon-tea.

The potential plant community on the Blazon soil is 40 percent grasses, 10 percent forbs, and 50 percent shrubs. The overstory density is 15 to 20 percent. Important plants are pinyon, Utah juniper, bluegrass, Indian ricegrass, Bigelow sagebrush, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Undesirable plants can be controlled by chaining, burning, or spraying with chemicals. Seeding may be successful during years of favorable precipitation. After broadcast seeding, the seed should be covered by pulling a Dixie harrow or an anchor chain over the area. Plants other than native species that are suitable for seeding include Siberian wheatgrass, crested wheatgrass, Russian wildrye, and bluebunch wheatgrass.

This map unit is in capability subclass VIe, nonirrigated. The Circleville soil is in the Upland Stony Loam range site, and the Blazon soil is in the Upland Shallow Loam (Pinyon-Juniper) woodland site.

28—Delson cobbly loam, 15 to 30 percent slopes. This very deep, well drained soil is on mountainsides. It formed in alluvium derived dominantly from diorite, shale, and sandstone. Slopes are concave to convex and are medium in length. The present vegetation in most areas is mainly pinyon, muttongrass, and Sandberg bluegrass. Some areas have been chained and seeded to other species. Elevation is 7,500 to 9,500 feet. The average annual precipitation is about 16 to 18 inches, the average annual air temperature is 35 to 40 degrees F, and the freeze-free period is 50 to 75 days.

Typically, the surface layer is dark grayish brown cobbly loam about 15 inches thick. The subsoil is brown cobbly clay about 25 inches thick. The substratum to a depth of 60 inches or more is brown very cobbly clay.

Included in this unit are about 15 percent Delson soils that have slopes of more than 30 percent, 10 percent Blazon cobbly clay loam, and 5 percent Makoti family clay loam.

Permeability of this Delson soil is slow. Available water capacity is about 7 to 9 inches. Water supplying capacity is 11 to 16 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 3 to 6 percent. Runoff is medium, and the hazard of water erosion is moderate.

This unit is used as rangeland, woodland, wildlife habitat, and watershed.

The potential plant community is 40 percent grasses, 15 percent forbs, and 45 percent shrubs. The overstory is pinyon and Utah juniper. The understory is Wyoming big sagebrush, green Mormon-tea, muttongrass, bluebunch wheatgrass, blue grama, bottlebrush squirreltail, Indian ricegrass, and needleandthread.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is fair. The main limitations are the cobbly surface layer and steepness of slope. Brush can be controlled by mechanical treatment or application of chemicals. Pinyon and juniper can be removed by mechanical treatment or prescribed burning. Windrowing and burning of trees, after the original burning or chaining, is needed to prepare an area for seeding. If broadcast seeding is used, it is a good practice to cover the seed by pulling a Dixie harrow, anchor chain, or other similar equipment over the area. Plants other than native species that are suitable for seeding include intermediate wheatgrass, crested wheatgrass, Russian wildrye, topar wheatgrass, and alfalfa.

This map unit is in capability subclass VIe, nonirrigated. It is in the Upland Gravelly Loam (Pinyon-Juniper) woodland site.

29—Delson-Datino family complex. This map unit is on mountainsides. Slopes are 30 to 50 percent, are concave to convex, and are short. The present vegetation in most areas is mainly Gambel oak, serviceberry, snowberry, big sagebrush, and muttongrass. Elevation is 8,500 to 10,000 feet. The average annual precipitation is about 20 to 25 inches, the average annual air temperature is 34 to 38 degrees F, and the freeze-free period is 50 to 75 days.

This unit is 50 percent Delson cobbly loam, cool, 30 to 50 percent slopes; 25 percent Datino family soils, 30 to 50 percent slopes; and 25 percent other soils, Rock outcrop, and Rubble land.

Included in this unit are about 10 percent Rock outcrop, 10 percent soils that are similar to the Datino family soils but are less than 20 inches deep over shale, and 5 percent Rubble land.

The Delson soil is very deep and well drained. It formed in alluvium and colluvium derived dominantly from diorite and shale. Typically, the surface layer is dark grayish brown cobbly loam about 15 inches thick. The subsoil is brown cobbly clay about 25 inches thick. The substratum to a depth of 60 inches or more is brown very cobbly clay.

Permeability of the Delson soil is slow. Available water capacity is about 5.5 to 7.5 inches. Water supplying capacity is 14 to 16 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 3 to 6 percent. Runoff is medium, and the hazard of water erosion is moderate.

The Datino family soils are moderately deep and well drained. They formed in alluvium and colluvium derived dominantly from shale. No single profile of these soils is typical, but one commonly observed in the survey area has a surface layer that is brown loam about 10 inches thick. The subsoil is brown very gravelly clay loam about 11 inches thick. Unweathered shale is at a depth of 21 inches. Depth to shale ranges from 20 to 40 inches.

Permeability of the Datino family soils is moderately slow to the restrictive layer. Available water capacity is about 2.0 to 3.5 inches. Water supplying capacity is 7 to 11 inches. Effective rooting depth is 20 to 40 inches. The organic matter content of the surface layer is about 2 to 5 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used as rangeland, wildlife habitat, and watershed.

The potential plant community on this unit is 25 percent grasses, 10 percent forbs, and 65 percent shrubs. Important plants are Gambel oak, snowberry, wheatgrass, and bluegrass.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Because of the steepness of slope, grazing should be carefully managed to prevent overgrazing, which results in excessive soil erosion. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is steepness of slope; however, for emergency erosion control following a fire or for other special needs, seeding could be done by aerial methods.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Mountain Loam (Oak) range site.

30—Delson-Makoti family complex. This map unit is on mountainsides. Slopes are 30 to 50 percent, are concave to convex, and are short. The present vegetation in most areas is mainly pinyon, Utah juniper, big sagebrush, muttongrass, and Sandberg bluegrass. Elevation is 7,500 to 9,500 feet. The average annual precipitation is about 16 to 18 inches, the average annual air temperature is 35 to 43 degrees F, and the freeze-free period is 50 to 75 days.

This unit is 55 percent Delson cobbly loam, 30 to 50 percent slopes; 25 percent Makoti family soils, 30 to 50 percent slopes; and 20 percent other soils.

Included in this unit are about 10 percent Pando family soils, 5 percent Circleville cobbly loam, and 5 percent soils at higher elevations that at a depth of 20 inches have a summer temperature that is lower than 59 degrees F.

The Delson soil is very deep and well drained. It formed in alluvium derived dominantly from diorite, sandstone, and shale. Typically, the surface layer is dark grayish brown cobbly loam about 16 inches thick. The subsoil is brown cobbly clay about 24 inches thick. The substratum to a depth of 60 inches or more is brown very cobbly clay.

Permeability of the Delson soil is slow. Available water capacity, to a depth of 60 inches, is about 7 to 9 inches. Water supplying capacity is 11 to 16 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 3 to 6 percent. Runoff is medium, and the hazard of water erosion is moderate.

The Makoti family soils are deep and well drained. They formed in alluvium derived dominantly from shale. No single profile of these soils is typical, but one commonly observed in the survey area has a surface layer that is very dark grayish brown clay loam about 4 inches thick. The subsoil is dark grayish brown and grayish brown silty clay loam about 37 inches thick or more. Shale is at a depth of 41 inches. Depth to shale ranges from 40 to 60 inches.

Permeability of the Makoti family soils is slow to the restrictive layer. Available water capacity to the restrictive layer is 5.5 to 8.0 inches. Water supplying capacity is 11 to 16 inches. Effective rooting depth is 40 to 60 inches. The organic matter content of the surface layer is about 4 to 6 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used as rangeland, woodland, and wildlife habitat.

The potential plant community on this unit is 30 percent grasses, 10 percent forbs, and 60 percent shrubs. Important plants are pinyon, Utah juniper, Wyoming big sagebrush, muttongrass, and bluebunch wheatgrass.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Range seeding on this unit is not suitable because of the steepness of slope.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Upland Gravelly Loam (Pinyon-Juniper) woodland site.

31—Duneland-Mido complex. This map unit is on mesas and benches. Slcpes are 4 to 15 percent, are concave to convex, and are short. The present vegetation in most areas is mainly Indian ricegrass, Mormon-tea, mesa dropseed, and sandhill muhly. Elevation is 4,800 to 6,000 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 60 percent Duneland and 40 percent Mido loamy fine sand, 4 to 15 percent slopes, severely eroded.

Duneland consists of sand-sized particles that have drifted and piled up as a result of action by the wind. The dunes are actively shifting so that no soil horizons have developed. Slopes are short and broken. Runoff is very slow, and the hazard of ersoion by water is slight. The hazard of erosion by wind is very high. There is very little if any vegetation on the dunes.

The Mido soil is very deep and excessively drained. It formed in eolian deposits derived dominantly from sandstone. Typically, the profile is light reddish brown loamy fine sand to a depth of 60 inches or more.

Permeability of the Mido soil is rapid. Available water capacity is about 3.0 to 5.5 inches. Water supplying capacity is 3 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 percent. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used mainly as wildlife habitat. It has very limited use as rangeland.

The potential plant community on the Mido soil is 50 percent grasses, 20 percent forbs, and 30 percent shrubs. Important plants are Indian ricegrass, dropseed, galleta, needleandthread, fourwing saltbush, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the sandy texture of the soil, and the areas of Dune land.

This map unit is in capability subclass VIIs, nonirrigated. The Mido soil is in the Semidesert Sand range site. Duneland is not placed in a range site.

32—Factory sandy loam, 2 to 8 percent slopes. This moderately deep, well drained soil is on alluvial fans and benches. It formed in alluvium derived dominantly from diorite and sandstone. Slopes are long. The present vegetation in most areas is mainly blackbrush, broom snakeweed, shadscale, and galleta. Elevation is 5,100 to 5,300 feet. The average annual precipitation is about 8 to 9 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is yellowish red sandy loam about 2 inches thick. The subsoil is yellowish red fine sandy loam about 6 inches thick. The substratum to a depth of 29 inches is reddish yellow gravelly sandy loam. An indurated, lime-cemented hardpan is at a depth of 29 inches. A layer of calcium carbonate accumulation is at a depth of 7 to 12 inches. Depth to the hardpan ranges from 20 to 40 inches.

Included in this unit are about 15 percent soils that are similar to this Factory soil but have a gravelly or cobbly surface and 5 percent Moffat loamy fine sand.

Permeability of this Factory soil is moderately rapid to the restrictive layer. Available water capacity is about 2 to 4 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 20 to 40 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are Indian ricegrass, sand dropseed, needleandthread, galleta, fourwing saltbush, blackbrush, Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the droughtiness of the soil.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Semidesert Sandy Loam (Blackbrush) range site.

33—Farb fine sandy loam, 4 to 15 percent slopes. This shallow, excessively drained soil is on mesas and benches. It formed in residuum and alluvium derived dominantly from sandstone. Slopes are medium in length. The present vegetation in most areas is mainly blackbrush and galleta. Elevation is 4,500 to 4,800 feet. The average annual precipitation is about 6 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 150 to 160 days.

Typically, the surface layer is light brown fine sandy loam about 2 inches thick. The underlying material to a depth of 17 inches is light brown fine sandy loam. Sandstone is at a depth of 17 inches. Depth to sandstone ranges from 10 to 20 inches.

Included in this unit are about 20 percent soils that are similar to this Farb soil but are 20 to 40 inches deep over sandstone, 5 percent Rock outcrop, and 5 percent Myton family soils on stream terraces.

Permeability of the Farb soil is moderately rapid to the restrictive layer. Available water capacity is about 2.0 to 2.5 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on this unit is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, Mormon-tea, and blackbrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow depth of the soil.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Desert Shallow Sandy Loam range site.

34—Farb-Rock outcrop complex. This map unit is on benches and mesas. Slopes are 4 to 15 percent, are concave to convex, and are short. The present vegetation in most areas is mainly Mormon-tea, galleta, Indian ricegrass, and blackbrush. Elevation is 4,500 to 4,800 feet. The average annual precipitation is about 6 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 150 to 160 days.

This unit is 40 percent Farb fine sandy loam, 4 to 15 percent slopes; 35 percent Rock outcrop; and 25 percent other soils and Badland.

Included in this unit are about 10 percent Badland, 10 percent Chipeta silty clay, and 5 percent Sheppard sand, hummocky.

The Farb soil is shallow and excessively drained. It formed in residuum and alluvium derived dominantly from sandstone. Typically, the surface layer is strong brown

fine sandy loam about 1 inch thick. The underlying material to a depth of 19 inches is reddish yellow fine sandy loam. Sandstone is at a depth of 19 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Farb soil is moderately rapid to the restrictive layer. Available water capacity is about 2 to 3 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Farb soil is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, Mormon-tea, and blackbrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, shallow depth of the soils, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Farb soil is in the Desert Shallow Sandy Loam range site. Rock outcrop is not placed in a range site.

35—Farb-Farb, very shallow-Rock outcrop complex. This map unit is on dissected mesas and benches. Slopes are 4 to 30 percent, are concave to convex, and are short. The present vegetation in most areas is mainly blackbrush, Mormon-tea, broom snakeweed, Bigelow sagebrush, and galleta. Elevation is 4,000 to 5,000 feet. The average annual precipitation is about 6 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 150 to 160 days.

This unit is 40 percent Farb fine sandy loam, 4 to 15 percent slopes; 35 percent Farb channery sandy loam, 4 to 30 percent slopes; 20 percent Rock outcrop; and 5 percent other soils.

Included in this unit is about 5 percent Chipeta silty clay.

The Farb fine sandy loam is shallow and excessively drained. It formed in residuum derived dominantly from sandstone. Typically, the surface layer is light brown fine sandy loam about 3 inches thick. The underlying material to a depth of 14 inches is light brown fine sandy loam. Sandstone is at a depth of 14 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Farb fine sandy loam is moderately rapid to the restrictive layer. Available water capacity is about 1.5 to 2.5 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

The Farb channery sandy loam is very shallow and excessively drained. It formed in residuum derived dominantly from sandstone. Typically, the surface layer is light brown channery sandy loam about 3 inches thick. The underlying material to a depth of 6 inches is brown channery sandy loam. Sandstone is at a depth of 6 inches. Depth to sandstone ranges from 5 to 10 inches.

Permeability of the Farb channery sandy loam is moderately rapid to the restrictive layer. Available water capacity is about 0.5 to 1.0 inch. Water supplying capacity is 2 inches. Effective rooting depth is 5 to 10 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is slight.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Farb fine sandy loam is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, Mormon-tea, and blackbrush.

The potential plant community on the Farb channery sandy loam is 30 percent grasses, 15 percent forbs, and 55 percent shrubs. Important plants are desert needlegrass, Indian ricegrass, galleta, fourwing saltbush, shadscale, Mormon-tea, and Bigelow sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, shallow soil depth of the Farb soil, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Farb fine sandy loam is in the Desert Shallow Sandy Loam range site, and the Farb channery sandy loam is in the Desert Very Shallow Sandy Loam range site. Rock outcrop is not placed in a range site.

36—Glenberg family. These very deep, well drained soils are on flood plains along intermittent drainageways

and rivers. They formed in alluvium derived dominantly from sandstone and igneous rock. Slopes are 0 to 3 percent and are short. The present vegetation in most areas is mainly saltcedar, cottonwood, alkali sacaton, and coyote willow. Elevation is 4,700 to 5,500 feet. The average annual precipitation is about 8 to 9 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

No single profile of these soils is typical, but one commonly observed in the survey area has a surface layer of light yellowish brown fine sandy loam about 3 inches thick. The upper 20 inches of the underlying material is light yellowish brown loam, and the lower part to a depth of 60 inches or more is light yellowish brown fine sandy loam and very fine sandy loam. These soils are highly stratified. They are moderately saline.

Included in this unit are small areas of Chipeta silty clay, Yarts fine sandy loam, Badland, and Rock outcrop.

Permeability of the Glenberg family soils is moderate. Available water capacity is about 7 to 10 inches. Water supplying capacity is 3 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used mainly as rangeland and wildlife habitat.

The potential plant community is 60 percent grasses, 10 percent forbs, and 30 percent shrubs. Important plants are alkali sacaton, inland saltgrass, coyote willow, and Fremont cottonwood.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and salinity.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Semiwet Salt Streambank range site.

37—Goblin-Chipeta complex. This map unit is on dissected uplands and pediment surfaces. Slopes are 2 to 30 percent, are concave to convex, and are short. The present vegetation in most areas is mainly deserttrumpet, mat saltbush, galleta, and Mormon-tea. Elevation is 4,600 to 5,600 feet. The average annual precipitation is about 6 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 50 percent Goblin loam, 2 to 30 percent slopes, severely eroded; 30 percent Chipeta silty clay, 15 to 30 percent slopes, severely eroded; and 20 percent Badland, gypsum land, Rock outcrop, and other soils.

Included in this unit are about 5 percent Badland, 5 percent gypsum land; 5 percent Rock outcrop, and 5 percent Farb fine sandy loam and soils that are similar to the Chipeta soil but are red.

The Goblin soil is very shallow and well drained. It formed in residuum derived dominantly from gypsiferous shale and sandstone. Typically, the surface layer is light reddish brown loam about 3 inches thick. The underlying material to a depth of 12 inches is yellowish red loam. Gypsiferous shale is at a depth of 12 inches. Depth to shale ranges from 5 to 20 inches.

Permeability of the Goblin soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 inch to 2.0 inches. Water supplying capacity is 2 inches. Effective rooting depth is 5 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

The Chipeta soil is shallow and well drained. It formed in residuum derived dominantly from shale. Typically, the surface layer is light olive gray silty clay about 1 inch thick. The underlying material to a depth of 19 inches is light olive brown silty clay loam. Shale is at a depth of 19 inches. Depth to shale ranges from 10 to 20 inches.

Permeability of the Chipeta soil is slow to the restrictive layer. Available water capacity is about 2 to 3 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Goblin soil is 25 percent grasses, 15 percent forbs, and 60 percent shrubs. Important plants are galleta, Indian ricegrass, Torrey Mormon-tea, and shadscale.

The potential plant community on the Chipeta soil is 20 percent grasses, 20 percent forbs, and 60 percent shrubs. Important plants are mat saltbush, Indian ricegrass, and deserttrumpet.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and restricted soil depth.

This map unit is in capability subclass VIIs, nonirrigated. The Goblin soil is in the Desert Very Shallow Gypsum range site, and the Chipeta soil is in the Desert Shallow Clay range site.

38—Green River-Myton families complex. This map unit is on flood plains, colluvial hillsides, and stream terraces. The Green River family soils are on the flood plains, the Myton family extremely bouldery soils are on the colluvial hillsides, and the Myton family very gravelly soils are on the stream terraces. Slopes are 0 to 50 percent; they are undulating and medium in length on the flood plains and are concave to convex and short on the hillsides and terraces. The present vegetation in most areas is mainly saltcedar and saltgrass on the flood plains and Indian ricegrass, galleta, and shadscale on the hillsides and terraces. Elevation is 3,800 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 49 to 53 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 35 percent Green River family soils, 0 to 2 percent slopes; 25 percent Myton family extremely bouldery soils, 15 to 50 percent slopes; 20 percent Myton family very gravelly soils, 2 to 15 percent slopes; and 20 percent other soils and Rock outcrop.

Included in this unit are about 10 percent Rock outcrop and 10 percent Sheppard loamy fine sand.

The Green River family soils are very deep and poorly drained. They formed in alluvium derived dominantly from sandstone and shale. No single profile is typical of these soils, but one commonly observed in the survey area has a surface layer that is light yellowish brown loamy fine sand about 6 inches thick. The subsoil is pale brown fine sandy loam that has few, fine, faint mottles and is about 14 inches thick. The upper 20 inches of the underlying material is light yellowish brown gravelly sandy loam that has few, faint mottles, and the lower part to a depth of 60 inches or more is light yellowish brown loam that has common, fine, distinct mottles. These soils are highly stratified.

Permeability of the Green River family soils is moderately rapid. Available water capacity is about 5.5 to 8.5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 3.0 percent. Runoff is slow, and the hazard of water erosion is slight. These soils are moderately saline to strongly saline. A water table is at a depth of about 36 inches. Flooding is common from June through September.

The Myton family extremely bouldery soils are very deep and well drained. They formed in colluvium derived dominantly from shale and sandstone. No single profile of these soils is typical, but one commonly observed in the survey area has a surface layer that is reddish brown extremely bouldery loam about 6 inches thick. The upper 24 inches of the underlying material is pinkish white very cobbly sandy loam, and the lower part to a depth of 60 inches or more is light reddish brown very cobbly sandy loam.

Permeability of these Myton family soils is moderately rapid. Available water capacity is about 3 to 5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is rapid, and the hazard of water erosion is high.

The Myton family very gravelly soils are very deep and well drained. They formed in alluvium derived dominantly from sandstone and diorite. No single profile of these soils is typical, but one commonly observed in the survey area has a surface layer that is reddish brown very gravelly sandy loam about 6 inches thick. The upper 24 inches of the underlying material is pinkish white very cobbly sandy loam, and the lower part to a depth of 60 inches or more is light reddish brown very cobbly sandy loam.

Permeability of these Myton family soils is moderately rapid. Available water capacity is about 3 to 5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Green River family soils is 60 percent grasses, 10 percent forbs, and 30 percent shrubs. Important plants are inland saltgrass, Indian ricegrass, alkali sacaton, coyote willow, and Fremont cottonwood.

The potential plant community on the Myton family extremely bouldery soils is 40 percent grasses, 10 percent forbs, and 50 percent shrubs. Important plants are Salina wildrye, galleta, Indian ricegrass, blackbrush, Mormon-tea, and skunkbush sumac.

The potential plant community on the Myton family very gravelly soils is 30 percent grasses, 15 percent forbs, and 55 percent shrubs. Important plants are galleta, Indian ricegrass, bud sagebrush, and shadscale.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are the low precipitation, the salinity and the hazard of flooding on the Green River soils, and the extremely bouldery surface layer and steepness of slope of the Myton family soils.

This map unit is in capability subclass VIIs, nonirrigated. The Green River family soils are in the Semiwet Salt Streambank range site, the Myton family extremely bouldery soils are in the Talus Slope range site, and the Myton family very gravelly soils are in the Desert Stony Loam range site.

39—Hanksville-Chipeta complex. This map unit is on benches, hillsides, and alluvial fans. Slopes are 0 to 15 percent, are concave to convex, and are short. The present vegetation in most areas is mainly wedge saltbush, mat saltbush, and deserttrumpet. Elevation is 4,200 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 65 percent Hanksville clay loam, 0 to 4 percent slopes, eroded; 25 percent Chipeta silty clay, 2 to 15 percent slopes, severely eroded; and 10 percent other soils and Badland.

Included in this unit are about 5 percent soils that are similar to the Hanksville soil but are 40 to 60 inches deep to shale and 5 percent Badland.

The Hanksville soil is moderately deep and well drained. It formed in alluvium derived dominantly from shale. Typically, the surface layer is olive gray clay loam about 7 inches thick. The upper 9 inches of the underlying material is olive gray clay loam, and the lower part to a depth of 39 inches is olive gray silty clay. Shale is at a depth of 39 inches. Depth to shale ranges from 20 to 40 inches. This soil is moderately saline to strongly saline.

Permeability of the Hanksville soil is very slow to the restrictive layer. Available water capacity is about 5.5 to 7.8 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 20 to 40 inches. The organic matter content of the surface layer is less than 0.5 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

The Chipeta soil is shallow and well drained. It formed in residuum derived dominantly from shale. Typically, the surface layer is light yellowish brown silty clay about 1 inch thick. The substratum to a depth of 19 inches or more is light olive brown silty clay loam. Shale is at a depth of 19 inches. Depth to shale ranges from 10 to 20 inches.

Permeability of the Chipeta soil is slow to the restrictive layer. Available water capacity is about 2 to 3 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Hanksville soil is 25 percent grasses, 15 percent forbs, and 60 percent shrubs. Important plants are galleta, Indian ricegrass, saltbush, and shadscale.

The potential plant community on the Chipeta soil is 20 percent grasses, 20 percent forbs, and 60 percent shrubs. Important plants are mat saltbush, galleta, Indian ricegrass, and deserttrumpet.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow depth of the Chipeta soil.

This map unit is in capability subclass VIIs, nonirrigated. The Hanksville soil is in the Desert Clay range site, and the Chipeta soil is in the Desert Shallow Clay range site.

40—Haverdad silt loam. This very deep, well drained soil is in alluvial valleys. It formed in alluvium derived dominantly from sandstone and shale. Slopes are 0 to 2 percent and are medium in length. The present vegetation in most areas is mainly greasewood, seepweed, alkali sacaton, bottlebrush squirreltail, and galleta. Elevation is 5,000 to 6,000 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is grayish brown silt loam about 9 inches thick. The upper 12 inches of the underlying material is grayish brown loam, and the lower part to a depth of 60 inches or more is grayish brown silt loam. This soil is moderately saline to strongly saline.

Included in this unit is about 10 percent Mivida loamy fine sand.

Permeability of the Haverdad soil is moderate. Available water capacity is about 7 to 10 inches. Water supplying capacity is 5.5 to 8.0 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate. This soil is occasionally flooded in spring and summer.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 40 percent grasses, 20 percent forbs, and 40 percent shrubs. Important plants are alkali sacaton, galleta, black greasewood, and seepweed.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the salinity of the soil.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Alkali Flat range site.

41—Jocity loam. This very deep, well drained soil is on alluvial fans and stream terraces. It formed in alluvium derived dominantly from shale and sandstone. Slopes are 1 to 2 percent and are long. Elevation is 4,400 to 4,700 feet. The average annual precipitation is about 5 to 7 inches, the average annual air temperature is 51 to 53 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is light brown, mildly alkaline loam about 6 inches thick. The upper 38 inches of the underlying material is light reddish brown, mildly alkaline loam, and the lower part to a depth of 60 inches or more is light reddish brown, mildly alkaline fine sandy loam.

Included in this unit are about 10 percent Billings silty clay loam and 5 percent Trachute loamy fine sand.

Permeability of the Jocity soil is moderate. Available water capacity is about 8 to 9 inches. Water supplying capacity is 3 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is less than 1 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used as irrigated cropland and wildlife habitat.

The main crops grown are alfalfa, alfalfa-grass, small grain, and corn for silage. A suitable crop rotation consists of alfalfa or alfalfa-grass, corn for silage, and small grain. The grain and corn should not be grown more than 30 percent of the rotation time. Fall plowing and minimum tillage are needed. Use of crop residue and commercial fertilizer maintains good soil tilth and fertility. Fertility levels can be checked by the use of soil fertility tests. Weed control by mechanical or chemical means is essential to maintain good production and a favorable plant community.

Furrow, border corrugation, and sprinkler irrigation systems are suited to this unit. Water should be applied in amounts sufficient to wet the root zone but in amounts small enough to minimize the leaching of plant nutrients. Grazing when the soil is moist results in compaction of the surface layer, poor tilth, and excessive runoff.

If irrigated, this unit can produce about 7 tons of alfalfa hay, 100 bushels of corn, or 20 tons of corn silage per acre.

This map unit is in capability unit IIe-2, irrigated. The soil in this unit, where irrigated, is prime farmland.

42—Jocity clay. This very deep, well drained soil is on alluvial fans. It formed in alluvium derived dominantly from sandstone and shale. Slopes are 1 to 2 percent and are long. Elevation is 4,400 to 4,500 feet. The average annual precipitation is about 5 to 7 inches, the average annual air temperature is 51 to 53 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is pinkish gray, mildly alkaline clay about 13 inches thick. The upper 31 inches of the underlying material is pinkish gray, mildly alkaline clay loam, and the lower part to a depth of 60 inches or more is pinkish gray, moderately alkaline loam and clay loam.

Included in this unit are about 10 percent soils that are similar to this Jocity soil but are moderately saline-alkali loam and 5 percent Billings silty clay loam.

Permeability of the Jocity soil is moderately slow. Available water capacity is about 9.5 to 11.0 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is less than 1 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used as irrigated cropland and wildlife habitat.

The main crops grown are alfalfa, alfalfa-grass, small grain, and corn for silage. A suitable crop rotation consists of alfalfa or alfalfa-grass, corn for silage, and small grain. The grain and corn should not be grown more than 30 percent of the rotation time. The main limitation is the clay surface. Fall plowing and minimum tillage are needed. Use of crop residue and commercial fertilizer helps to maintain good soil tilth and fertility. Weed control by mechanical or chemical means is essential to maintain good production and a favorable plant community.

Furrow, border corrugation, and sprinkler irrigation systems are suited to this unit. Water should be applied in amounts sufficient to wet the root zone but in amounts small enough to minimize the leaching of plant nutrients. Grazing when the soil is moist results in compaction of the surface layer, poor tilth, and excessive runoff.

If irrigated, this unit can produce about 7 tons of alfalfa hay or 20 tons of corn silage per acre.

This map unit is in capability unit IIs-15, irrigated. The soil in this unit, where irrigated, is prime farmland.

43—Leebench gravelly clay loam, 4 to 8 percent slopes. This very deep, well drained soil is on fan terraces and alluvial fans. It formed in alluvium derived dominantly from shale, sandstone, and diorite. Slopes are undulating and are medium in length. The present vegetation in most areas is mainly wedgeleaf saltbush, bud sagebrush, galleta, and deserttrumpet. Elevation is 4,700 to 4,800 feet. The average annual precipitation is about 5 to 7 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is very pale brown gravelly clay loam about 3 inches thick. The subsoil is brown clay loam about 5 inches thick. The substratum to a depth of 60 inches or more is pale brown gravelly loam. A layer of calcium carbonate accumulation is at a depth of 3 to 20

inches. This soil is affected by sodium throughout most of the profile.

Included in this unit are about 5 percent Chipeta silty clay and 5 percent Blackston gravelly fine sandy loam.

Permeability of the Leebench soil is slow. Available water capacity is about 6 to 10 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 percent. Runoff is medium, and the hazard of water erosion is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 25 percent grasses, 25 percent forbs, and 50 percent shrubs. Important plants are galleta, Indian ricegrass, deserttrumpet, wedgeleaf saltbush, shadscale, and bud sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the alkali condition of the soil.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Alkali Fan range site.

44—Leebench-Hanksville complex. This map unit is on benches and mesas. Slopes are 0 to 8 percent and are medium in length. The present vegetation in most areas is mainly wedgeleaf saltbush, shadscale, galleta, and deserttrumpet. Elevation is 4,750 to 4,950 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 60 percent Leebench fine sandy loam, 2 to 8 percent slopes; 30 percent Hanksville clay loam, 0 to 4 percent slopes; and 10 percent other soils and Badland.

Included in this unit is about 10 percent Chipeta silty clay. Also included are small areas of Badland.

The Leebench soil is very deep and well drained. It formed in alluvium derived dominantly from shale and sandstone. Typically, the surface layer is yellowish brown fine sandy loam about 3 inches thick. The subsoil is light yellowish brown clay loam about 22 inches thick. The substratum to a depth of 60 inches or more is very pale brown gravelly clay loam. A layer of calcium carbonate accumulation is at a depth of 3 to 20 inches. This soil is affected by sodium throughout most of the profile.

Permeability of the Leebench soil is slow. Available water capacity is about 6 to 10 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

The Hanksville soil is moderately deep and well drained. It formed in alluvium derived dominantly from shale. Typically, the surface layer is grayish brown clay loam about 2 inches thick. The underlying material to a depth of 39 inches is grayish brown silty clay. Shale is at a depth of 39 inches. Depth to shale ranges from 20 to 40 inches. This soil is moderately saline to strongly saline.

Permeability of the Hanksville soil is very slow to the restrictive layer. Available water capacity is about 5.5 to 7.0 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 20 to 40 inches. The organic matter content of the surface layer is about 0.5 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Leebench soil is 25 percent grasses, 25 percent forbs, and 50 percent shrubs. Important plants are galleta, Indian ricegrass, deserttrumpet, wedgeleaf saltbush, and bud sagebrush.

The potential plant community on the Hanksville soil is 25 percent grasses, 15 percent forbs, and 60 percent shrubs. Important plants are galleta, Indian ricegrass, wedgeleaf saltbush, and shadscale.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the saline and alkali condition of the soils.

This map unit is in capability subclass VIIs, nonirrigated. The Leebench soil is in the Alkali Fan range site, and the Hanksville soil is in the Desert Clay range site.

45—Mellenthin-Rock outcrop-Mido complex. This map unit is on hillsides, ridges, and mesas. Slopes are 4 to 30 percent, are concave to convex, and are short. The present vegetation in most areas is mainly Utah juniper, pinyon, Mormon-tea, shadscale, and Indian ricegrass. The Utah juniper and pinyon grow mostly on the Mellenthin soils. Elevation is 6,000 to 6,500 feet. The average annual precipitation is about 8 to 12 inches, the average annual air temperature is 45 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 30 percent Mellenthin gravelly fine sandy loam, 4 to 30 percent slopes, eroded; 30 percent Rock outcrop; 20 percent Mido loamy fine sand, 4 to 15 percent slopes, eroded; and 20 percent other soils.

Included in this unit are about 15 percent Begay loamy fine sand and 5 percent Mellenthin soils that have a channery surface layer.

The Mellenthin soil is shallow and well drained. It formed in residuum derived dominantly from sandstone. Typically, the surface layer is yellowish red gravelly fine sandy loam about 3 inches thick. The subsoil is reddish brown very channery fine sandy loam about 7 inches thick. The substratum to a depth of 16 inches or more is light reddish brown very channery fine sandy loam. Sandstone is at a depth of 16 inches. Depth to sandstone ranges from 10 to 20 inches. A layer of calcium carbonate accumulation is at a depth of 10 and 16 inches.

Permeability of the Mellenthin soil is moderate to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

Rock outcrop consists of exposed areas of barren or nearly barren bedrock. It occurs mainly as nearly vertical cliffs and ledges.

The Mido soil is very deep and excessively drained. It formed in eolian material derived dominantly from sandstone. Typically, the profile is reddish brown loamy fine sand to a depth of 60 inches or more.

Permeability of the Mido soil is rapid. Available water capacity is about 3 to 5 inches. Water supplying capacity is 3 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland, wildlife habitat, and woodland.

The potential plant community on the Mellenthin soil is 35 percent grasses, 20 percent forbs, and 45 percent shrubs. Important understory plants are Indian ricegrass, galleta, eriogonum, fourwing saltbush, shadscale, and Mormon-tea. The overstory is Utah juniper and pinyon.

The potential plant community on the Mido soil is 50 percent grasses, 20 percent forbs, and 30 percent shrubs. Important plants are Indian ricegrass, galleta, needleandthread, dropseed, fourwing saltbush, Mormon-tea, and sand sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the areas of Rock outcrop, the shallow depth of the Mellenthin soil, and the sandy texture of the Mido soil.

This map unit is in capability subclass VIIs, nonirrigated. The Mellenthin soil is in the Semidesert Shallow Sand (Juniper-Pinyon) woodland site, and the Mido soil is in the Semidesert Sand range site. Rock outcrop is not placed in a range site.

46—Mido loamy fine sand, 4 to 15 percent slopes. This very deep, excessively drained soil is on mesas and in broad valleys. It formed in eolian deposits derived dominantly from sandstone. Slopes are concave to convex and are short. The present vegetation in most areas is mainly Indian ricegrass, Mormon-tea, dropseed, sandhill muhly, and sand sagebrush. Elevation is 5,000 to 6,400 feet. The average annual precipitation is about 8 to 11 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the profile is reddish brown loamy fine sand to a depth of 60 inches or more.

Included in this unit are about 10 percent Begay fine sandy loam, 5 percent Mellenthin gravelly fine sandy loam, and 5 percent Moffat loamy fine sand.

Permeability of the Mido soil is rapid. Available water capacity is about 3.0 to 5.5 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 percent. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 50 percent grasses, 20 percent forbs, and 30 percent shrubs. Important plants are Indian ricegrass, dropseed, galleta, needleandthread, fourwing saltbush, Mormon-tea, and sand sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the sandy texture of the soil.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Semidesert Sand range site.

47—Mido-Wayneco-Milok complex. This map unit is on benches and mesas. Slopes are 2 to 30 percent, are concave to convex, and are short. The present vegetation in most areas is mainly blackbrush, Mormon-tea, sand sagebrush, wavyleaf oak, broom snakeweed, and Indian ricegrass. The blackbrush grows mainly on

the Wayneco and Milok soils. Elevation is 5,200 to 5,500 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 48 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 35 percent Mido loamy fine sand, hummocky, 4 to 15 percent slopes; 30 percent Wayneco fine sandy loam, 2 to 30 percent slopes, eroded; 25 percent Milok loamy fine sand, 4 to 8 percent slopes, eroded; and 10 percent other soils and Rock outcrop.

Included in this unit are about 5 percent Wayneco soils that are less than 10 inches deep and 5 percent Rock outcrop.

The Mido soil is very deep and excessively drained. It formed in eolian deposits derived dominantly from sandstone. Typically, the profile is yellowish red loamy fine sand to a depth of 60 inches or more.

Permeability of the Mido soil is rapid. Available water capacity is about 3.5 to 6.0 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 percent. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Wayneco soil is shallow and well drained. It formed in residuum and alluvium derived dominantly from sandstone. Typically, the surface layer is reddish brown fine sandy loam about 2 inches thick. The subsoil is red loam about 6 inches thick. The substratum to a depth of 16 inches or more is pink loam. Sandstone is at a depth of 16 inches. A layer of calcium carbonate accumulation is at a depth of 4 to 9 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Wayneco soil is moderate to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

The Milok soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone. Typically, the surface layer is light reddish brown loamy fine sand about 3 inches thick. The subsoil is light reddish brown fine sandy loam about 7 inches thick. The upper 32 inches of the substratum is pinkish white fine sandy loam, and the lower part to a depth of 60 inches or more is light reddish brown fine sandy loam. A layer of calcium carbonate accumulation is at a depth of 10 to 20 inches.

Permeability of the Milok soil is moderately rapid. Available water capacity is about 5.5 to 8.5 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Mido soil is 50 percent grasses, 20 percent forbs, and 30 percent shrubs. Important plants are Indian ricegrass, dropseed, galleta, needleandthread, Mormon-tea, and sand sagebrush.

The potential plant community on the Wayneco soil is 15 percent grasses, 25 percent forbs, and 60 percent shrubs. Important plants are Indian ricegrass, galleta, and Bigelow sagebrush.

The potential plant community on the Milok soil is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are blackbrush, Mormon-tea, sand dropseed, needleandthread, Indian ricegrass, galleta, black grama, and fourwing saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the sandy texture of the Mido soil, and the shallow depth of the Wayneco soil.

This map unit is in capability subclass VIIs, nonirrigated. The Mido soil is in the Semidesert Sand range site, the Wayneco soil is in the Semidesert Shallow Sandy Loam (Blackbrush) range site, and the Milok soil is in the Semidesert Sandy Loam (Blackbrush) range site.

48—Milok loamy fine sand, 4 to 8 percent slopes. This very deep, well drained soil is on ridges that branch from mesas and uplands. It formed in alluvium derived dominantly from sandstone. Slopes are undulating and are medium in length. The present vegetation in most areas is mainly black sagebrush, Indian ricegrass, galleta, and annual weeds. Elevation is 5,100 to 5,600 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is yellowish red loamy fine sand about 4 inches thick. The subsoil is reddish yellow loamy fine sand about 8 inches thick. The upper 35 inches of the substratum is light brown fine sandy loam, and the lower part to a depth of 60 inches or more is reddish yellow gravelly loamy sand. A layer of calcium carbonate accumulation is at a depth of 10 to 20 inches.

Included in this unit are about 10 percent Mido loamy fine sand and 5 percent soils that are similar to this Milok soil but have sandstone at a depth of 40 to 60 inches.

Permeability of the Milok soil is moderately rapid. Available water capacity is about 5 to 7 inches. Water

supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The potential plant community is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are blackbrush, Mormon-tea, sand dropseed, Indian ricegrass, galleta, black grama, needleandthread, and fourwing saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Semidesert Sandy Loam (Blackbrush) range site.

49—Milok sandy loam. This very deep, well drained soil is on benches. It formed in alluvium derived dominantly from sandstone and igneous rock. Slopes are 1 to 2 percent and are medium in length. Elevation is 5,200 to 5,550 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is reddish brown, mildly alkaline sandy loam about 5 inches thick. The subsoil is reddish brown, moderately alkaline fine sandy loam about 23 inches thick. The substratum to a depth of 60 inches or more is pink, strongly alkaline fine sandy loam. A layer of calcium carbonate accumulation is at a depth of 20 to 30 inches.

Included in this unit are about 10 percent soils that are similar to this Milok soil but have 15 to 35 percent rock fragments in the substratum and 5 percent Milok soils, on the Sandy Ranch, that have been silted with irrigation water and have a clay loam surface layer about 3 to 5 inches thick.

Permeability of this Milok soil is moderately rapid. Available water capacity is about 6.0 to 8.5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used as irrigated cropland and wildlife habitat.

The main crops grown are alfalfa, alfalfa-grass, small grain, and corn for silage. A suitable crop rotation consists of alfalfa or alfalfa-grass, corn for silage, and small grain. The grain and corn should not be grown more than 30 percent of the rotation time. Use of crop residue and commercial fertilizer maintains good soil tilth and fertility. Weed control by mechanical or chemical means is essential to maintain good production and a favorable plant community.

In some areas the supply of irrigation water is inadequate after midseason. Sprinkler irrigation is the most suitable method of applying water. Use of this method permits the even, controlled application of water, reduces runoff, and minimizes the risk of erosion. Water should be applied in amounts sufficient to wet the root zone but in amounts small enough to minimize the leaching of plant nutrients. Grazing when the soil is moist results in compaction of the surface layer, poor tilth, and excessive runoff.

This map unit is in capability unit IIs-26, irrigated.

50—Milok-Begay complex. This map unit is on benches. Slopes are 2 to 8 percent and are medium in length. The present vegetation in most areas is mainly Indian ricegrass, blackbrush, rabbitbrush, Mormon-tea, sandhill muhly, and galleta. Elevation is 5,350 to 5,700 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 65 percent Milok loamy fine sand, 4 to 8 percent slopes, eroded; 20 percent Begay loamy fine sand, 2 to 8 percent slopes, eroded; and 15 percent other soils and Rock outcrop.

Included in this unit are about 10 percent Mido loamy fine sand and 5 percent Rock outcrop.

The Milok soil is very deep and well drained. It formed in alluvial and eolian material derived dominantly from sandstone. Typically, the surface layer is yellowish red loamy fine sand about 4 inches thick. The subsoil is yellowish red loamy fine sand about 8 inches thick. The substratum to a depth of 60 inches or more is pink fine sandy loam. A layer of calcium carbonate accumulation is at a depth of 10 to 20 inches.

Permeability of the Milok soil is moderately rapid. Available water capacity is about 5.5 to 8.0 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Begay soil is very deep and well drained. It formed in alluvial and eolian deposits derived dominantly from sandstone. Typically, the surface layer is yellowish red loamy fine sand about 3 inches thick. The subsoil is yellowish red loamy fine sand about 5 inches thick. The upper 24 inches of the substratum is yellowish red sandy loam, and the lower part to a depth of 60 inches or more is reddish yellow loamy fine sand.

Permeability of the Begay soil is moderately rapid. Available water capacity is about 6.5 to 9.5 inches.

Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Milok soil is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are blackbrush, Mormon-tea, sand dropseed, Indian ricegrass, galleta, needleandthread, and fourwing saltbush.

The potential plant community on the Begay soil is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are Indian ricegrass, needleandthread, fourwing saltbush, winterfat, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIe, nonirrigated. The Milok soil is in the Semidesert Sandy Loam (Blackbrush) range site, and the Begay soil is in the Semidesert Sandy Loam range site.

51—Milok-Chipeta complex. This map unit is on terraces and hillsides. Slopes are 4 to 30 percent, are concave to convex, and are medium in length. The present vegetation in most areas is mainly blackbrush, mat saltbush, and broom snakeweed. Elevation is 4,900 to 5,100 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 50 percent Milok loamy fine sand, 4 to 8 percent slopes, eroded; 35 percent Chipeta silty clay, 15 to 30 percent slopes, severely eroded; and 15 percent Badland and Rock outcrop.

Included in this unit are about 10 percent Rock outcrop and 5 percent Badland.

The Milok soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone. Typically, the surface layer is light reddish brown loamy fine sand about 2 inches thick. The subsoil is reddish brown fine sandy loam about 8 inches thick. The upper 36 inches of the substratum is pinkish white fine sandy loam, and the lower part to a depth of 60 inches or more is light reddish brown fine sandy loam. A layer of calcium carbonate accumulation is at a depth of 10 to 20 inches.

Permeability of the Milok soil is moderately rapid. Available water capacity is about 6.0 to 8.5 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Chipeta soil is shallow and well drained. It formed in residuum derived dominantly from shale. Typically, the surface layer is light yellowish brown silty clay about 3 inches thick. The underlying material to a depth of 11 inches is light yellowish brown silty clay. Shale is at a depth of 11 inches. Depth to shale ranges from 10 to 20 inches.

Permeability of the Chipeta soil is slow to the restrictive layer. Available water capacity is about 1 inch to 3.5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 2 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Milok soil is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are blackbrush, Mormon-tea, sand dropseed, Indian ricegrass, galleta, needleandthread, and fourwing saltbush.

The potential plant community on the Chipeta soil is 20 percent grasses, 20 percent forbs, and 60 percent shrubs. Important plants are mat saltbush, deserttrumpet, galleta, and Indian ricegrass.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow depth of the Chipeta soil.

This map unit is in capability subclass VIIe, nonirrigated. The Milok soil is in the Semidesert Sandy Loam (Blackbrush) range site, and the Chipeta soil is in the Desert Shallow Clay range site.

52—Milok-Mido complex. This map unit is on benches. Slopes are 4 to 15 percent, are concave to convex, and are medium in length. The present vegetation in most areas is mainly blackbrush, wavyleaf oak, Mormon-tea, and Indian ricegrass. The blackbrush is mainly on the Milok soil. Elevation is 5,300 to 5,800 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 40 percent Milok loamy fine sand, 4 to 8 percent slopes, eroded; 35 percent Mido loamy fine

sand, hummocky, 4 to 15 percent slopes; and 25 percent other soils and Rock outcrop.

Included in this unit are about 10 percent Wayneco fine sandy loam; 5 percent Rock outcrop; 5 percent Glenberg family fine sandy loam in drainageways; and 5 percent Strych gravelly fine sandy loam on ridges and remnant benches.

The Milok soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone. Typically, the surface layer is reddish brown loamy fine sand about 3 inches thick. The subsoil is yellowish red fine sandy loam about 10 inches thick. The substratum to a depth of 60 inches or more is pink fine sandy loam. A layer of calcium carbonate accumulation is at a depth of 10 to 20 inches.

Permeability of the Milok soil is moderately rapid. Available water capacity is about 5.5 to 8.5 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Mido soil is very deep and excessively drained. It formed in eolian deposits derived dominantly from sandstone. Typically, the profile is light reddish brown loamy fine sand to a depth of 60 inches or more.

Permeability of the Mido soil is rapid. Available water capacity is about 3.5 to 6.0 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 percent. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Milok soil is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are blackbrush, Mormon-tea, sand dropseed, Indian ricegrass, galleta, needleandthread, and fourwing saltbush.

The potential plant community on the Mido soil is 50 percent grasses, 20 percent forbs, and 30 percent shrubs. Important plants are Indian ricegrass, dropseed, galleta, needleandthread, fourwing saltbush, Mormon-tea, and sand sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the sandy texture of the Mido soil.

This map unit is in capability subclass VIIs, nonirrigated. The Milok soil is in the Semidesert Sandy Loam (Blackbrush) range site, and the Mido soil is in the Semidesert Sand range site.

53—Milok-Pastern complex. This map unit is on benches and mesas. Slopes are 2 to 15 percent, are concave to convex, and are short. The present vegetation in most areas is mainly blackbrush, galleta, Indian ricegrass, Mormon-tea, broom snakeweed, and sand dropseed. The blackbrush is mainly on the Milok soil. Elevation is 4,700 to 5,800 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 48 to 50 degrees F, and the freeze-free period is 130 to 150 days.

This unit is 60 percent Milok loamy fine sand, 4 to 8 percent slopes; 25 percent Pastern fine sandy loam, 2 to 15 percent slopes; and 15 percent other soils.

Included in this unit is about 15 percent Mido loamy fine sand.

The Milok soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone. Typically, the surface layer is yellowish red loamy fine sand about 4 inches thick. The subsoil is yellowish red fine sandy loam about 8 inches thick. The upper 28 inches of the substratum is pink fine sandy loam, and the lower part to a depth of 60 inches or more is reddish yellow fine sandy loam. A layer of calcium carbonate accumulation is at a depth of 10 to 20 inches.

Permeability of the Milok soil is moderately rapid. Available water capacity is about 5.5 to 8.5 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Pastern soil is shallow and well drained. It formed in alluvium derived dominantly from sandstone. Typically, the surface layer is yellowish brown fine sandy loam about 3 inches thick. The subsoil is yellowish red fine sandy loam about 2 inches thick. The substratum to a depth of 12 inches is yellowish red gravelly loam. An indurated, lime-cemented hardpan is at a depth of 12 inches. A layer of calcium carbonate accumulation is at a depth of 5 to 6 inches. Depth to the hardpan ranges from 10 to 20 inches.

Permeability of the Pastern soil is moderate to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Milok soil is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are blackbrush, Mormon-tea,

sand dropseed, Indian ricegrass, galleta, needleandthread, and fourwing saltbush.

The potential plant community on the Pastern soil is 15 percent grasses, 25 percent forbs, and 60 percent shrubs. Important plants are blackbrush, Indian ricegrass, galleta, and Bigelow sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow depth of the Pastern soil.

This map unit is in capability subclass VIIe, nonirrigated. The Milok soil is in the Semidesert Sandy Loam (Blackbrush) range site, and the Pastern soil is in the Semidesert Shallow Sandy Loam (Blackbrush) range site.

54—Mivida loamy fine sand. This very deep, well drained soil is on fan terraces. It formed in alluvium derived dominantly from sandstone. Slopes are 0 to 4 percent and are medium in length. The present vegetation in most areas is mainly galleta, Indian ricegrass, fourwing saltbush, and Mormon-tea. Elevation is 5,000 to 6,000 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is yellowish red loamy fine sand about 6 inches thick. The subsoil is yellowish red fine sandy loam about 16 inches thick. The upper 20 inches of the substratum is yellowish red, strongly calcareous fine sandy loam, and the lower part to a depth of 60 inches or more is yellowish red fine sandy loam. A layer of calcium carbonate accumulation is at a depth of 20 to 30 inches.

Included in this unit is about 5 percent Goblin loam. Also included are small areas of Chipeta silty clay and Rock outcrop.

Permeability of the Mivida soil is moderately rapid. Available water capacity is about 5 to 8 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The potential plant community is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are needleandthread, Indian ricegrass, winterfat, fourwing saltbush, galleta, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Semidesert Sandy Loam range site.

55—Mivida-Goblin complex. This map unit is on terraces and fans. Slopes are 2 to 30 percent, are concave to convex, and are medium in length. The present vegetation in most areas is mainly galleta, Indian ricegrass, Mormon-tea, and fourwing saltbush. Elevation is 5,000 to 6,000 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 60 percent Mivida loamy fine sand, 0 to 4 percent slopes, eroded; 30 percent Goblin loam, 2 to 30 percent slopes, severely eroded; and 10 percent Badland and Rock outcrop.

Included in this unit are about 5 percent Badland and 5 percent Rock outcrop.

The Mivida soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone. Typically, the surface layer is yellowish red loamy fine sand about 6 inches thick. The subsoil is yellowish red fine sandy loam about 16 inches thick. The upper 20 inches of the substratum is yellowish red, strongly calcareous fine sandy loam, and the lower part to a depth of 60 inches or more is yellowish red fine sandy loam. A layer of calcium carbonate accumulation is at a depth of 20 to 30 inches.

Permeability of the Mivida soil is moderately rapid. Available water capacity is about 5.5 to 8.0 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Goblin soil is shallow and very shallow and is well drained. It formed in residuum derived dominantly from gypsiferous shale and sandstone. Typically, the surface layer is light reddish brown loam about 3 inches thick. The underlying material to a depth of 12 inches is yellowish red loam. Gypsiferous shale is at a depth of 12 inches. Depth to shale ranges from 4 to 20 inches.

Permeability of the Goblin soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 inch to 2.0 inches. Water supplying capacity is 2 inches. Effective rooting depth is 4 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0

percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Mivida soil is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are needleandthread, Indian ricegrass, galleta, winterfat, fourwing saltbush, and Mormon-tea.

The potential plant community on the Goblin soil is 25 percent grasses, 15 percent forbs, and 60 percent shrubs. Important plants are galleta, Indian ricegrass, Torrey Mormon-tea, club eriogonum, and shadscale.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow depth of the Goblin soil.

This map unit is in capability subclass VIIe, nonirrigated. The Mivida soil is in the Semidesert Sandy Loam range site, and the Goblin soil is in the Desert Very Shallow Gypsum range site.

56—Mivida Variant very cobbly very fine sandy loam, 15 to 40 percent slopes. This deep, well drained soil is on steep breaks below mesa rims. It formed in colluvium derived dominantly from sandstone, shale, and igneous rock. Slopes are concave to convex and are short. The present vegetation in most areas is mainly galleta, Salina wildrye, blackbrush, shadscale, and scattered Utah juniper. Elevation is 5,000 to 6,000 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 48 to 50 degrees F, and the freeze-free season is 120 to 150 days.

Typically, the surface layer is brown very cobbly very fine sandy loam about 8 inches thick. The subsoil is light yellowish brown very fine sandy loam about 7 inches thick. The underlying material to a depth of 48 inches is very pale brown fine sandy loam. Weathered shale is at a depth of 48 inches. A layer of calcium carbonate accumulation is at a depth of 10 to 20 inches. Depth to shale ranges from 40 to 60 inches.

Included in this unit are 5 percent Chipeta Variant clay loam and 10 percent Strych gravelly fine sandy loam.

Permeability of this Mivida Variant soil is moderate. Available water capacity is about 4 to 7 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 40 to 60 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is rapid, and the hazard of water erosion is high.

The potential plant community is 40 percent grasses, 10 percent forbs, and 50 percent shrubs. Important plants are Indian ricegrass, Salina wildrye, galleta, blackbrush, Mormon-tea, and skunkbush sumac.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Because of the steepness of slope, grazing should be carefully managed to prevent overgrazing, which results in excessive soil erosion. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, steepness of slope, and the very cobbly surface layer.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Talus Slope range site.

57—Moenkopie fine sandy loam. This shallow, well drained soil is on benches and mesas. It formed in residuum derived dominantly from sandstone. Slopes are 2 to 4 percent and are long. The present vegetation in most areas is mainly galleta, Indian ricegrass, blackbrush, and Mormon-tea. Elevation is 4,600 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 53 degrees F, and the freeze-free period is 150 to 170 days.

Typically, the surface layer is reddish yellow fine sandy loam about 3 inches thick. The underlying material to a depth of 19 inches is reddish yellow fine sandy loam. Sandstone is at a depth of 19 inches. Depth to sandstone ranges from 10 to 20 inches.

Included in this unit is about 10 percent Moenkopie channery sandy loam.

Permeability of the Moenkopie soil is moderately rapid to the restrictive layer. Available water capacity is about 1.5 to 2.5 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, Mormon-tea, and blackbrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season

of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow depth of the soil.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Desert Shallow Sandy Loam range site.

58—Moenkopie-Chipeta complex. This map unit is on benches. Slopes are 2 to 15 percent, are concave to convex, and are short. The present vegetation in most areas is mainly galleta, Indian ricegrass, blackbrush, and mat saltbush. The blackbrush is on the Moenkopie soil. Elevation is 4,600 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 53 degrees F, and the freeze-free period is 100 to 170 days.

This unit is 50 percent Moenkopie fine sandy loam, 4 to 15 percent slopes; 35 percent Chipeta silty clay, 2 to 15 percent slopes, severely eroded; and 15 percent Rock outcrop and Badland.

Included in this unit are about 10 percent Rock outcrop and 5 percent Badland.

The Moenkopie soil is shallow and well drained. It formed in residuum derived dominantly from sandstone. Typically, the surface layer is light brown fine sandy loam about 3 inches thick. The underlying material to a depth of 17 inches is light reddish brown fine sandy loam. Sandstone is at a depth of 17 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Moenkopie soil is moderately rapid to the restrictive layer. Available water capacity is about 1.5 to 2.5 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.25 to 1.00 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

The Chipeta soil is shallow and well drained. It formed in residuum derived dominantly from shale. Typically, the surface layer is light yellowish brown silty clay about 2 inches thick. The underlying material is light yellowish brown silty clay about 12 inches thick. Shale is at a depth of 14 inches. Depth to shale ranges from 10 to 20 inches.

Permeability of the Chipeta soil is slow to the restrictive layer. Available water capacity is about 1.5 to 2.5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Moenkopie soil is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, Mormon-tea, and black sagebrush.

The potential plant community on the Chipeta soil is 20 percent grasses, 20 percent forbs, and 60 percent shrubs. Important plants are mat saltbush, deserttrumpet, galleta, and Indian ricegrass.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow depth of the soil.

This map unit is in capability subclass VIIs, nonirrigated. The Moenkopie soil is in the Desert Shallow Sandy Loam range site, and the Chipeta soil is in the Desert Shallow Clay range site.

59—Moenkopie-Rock outcrop complex. This map unit is on dissected old pediment surfaces, upland benches, and mesas. Slopes are 4 to 30 percent, are concave to convex, and are short. The present vegetation in most areas is mainly shadscale, broom snakeweed, Mormon-tea, and Indian ricegrass. Elevation is 3,600 to 5,100 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 53 degrees F, and the freeze-free period is 150 to 170 days.

This unit is 50 percent Moenkopie fine sandy loam, 4 to 15 percent slopes; 30 percent Moenkopie channery sandy loam, 4 to 30 percent slopes, eroded; 10 percent Rock outcrop; and 10 percent other soils.

Included in this unit is about 10 percent soils that are similar to the Moenkopie soils but have more than 35 percent rock fragments throughout the profile.

The Moenkopie soils are very shallow and shallow and are well drained. They formed in residuum and alluvium derived dominantly from sandstone.

Typically, the surface layer of the Moenkopie fine sandy loam is light brown fine sandy loam about 3 inches thick. The underlying material to a depth of 14 inches is light reddish brown fine sandy loam. Sandstone is at a depth of 14 inches. Depth to sandstone ranges from 10 to 20 inches.

Typically, the surface layer of the Moenkopie channery sandy loam is yellowish red channery sandy loam about 2 inches thick. The underlying material to a depth of 9 inches is yellowish red sandy loam. Sandstone is at a depth of 9 inches. Depth to sandstone ranges from 5 to 10 inches. Content of rock fragments in the underlying layers ranges from 0 to 35 percent.

Permeability of the Moenkopie soils is moderately rapid to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 2 inches. Effective rooting depth is 5 to 20 inches. The

organic matter content of the surface layer is about 0.25 to 1.00 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Moenkopie fine sandy loam is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, and Mormon-tea.

The potential plant community on the Moenkopie channery sandy loam is 30 percent grasses, 15 percent forbs, and 55 percent shrubs. Important plants are Indian ricegrass, desert needlegrass, galleta, shadscale, Mormon-tea, and Bigelow sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, shallow and very shallow soil depth, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Moenkopie fine sandy loam is in the Desert Shallow Sandy Loam range site, and the Moenkopie channery sandy loam is in the Desert Very Shallow Sandy Loam range site. Rock outcrop is not placed in a range site.

60—Moffat loamy fine sand, 2 to 8 percent slopes. This very deep, well drained soil is on upland benches and alluvial fans. It formed in alluvial and eolian deposits derived dominantly from sandstone. Slopes are concave to convex and are medium in length. The present vegetation in most areas is mainly blackbrush, galleta, Indian ricegrass, and Mormon-tea. Elevation is 3,800 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 53 degrees F, and the freeze-free period is 140 to 170 days.

Typically, the surface layer is light reddish brown loamy fine sand about 2 inches thick. The subsoil is reddish brown fine sandy loam about 12 inches thick. The substratum to a depth of 60 inches or more is pinkish white, pink, and light reddish brown fine sandy loam. A layer of calcium carbonate accumulation is at a depth of 8 to 15 inches.

Included in this unit are about 10 percent Sheppard sand, 5 percent Moenkopie fine sandy loam, and 5 percent Rock outcrop.

Permeability of the Moffat soil is moderately rapid. Available water capacity is about 6.5 to 8.5 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The potential plant community is 35 percent grasses, 15 percent forbs, and 50 percent shrubs. Important plants are Indian ricegrass, galleta, spike dropseed, blackbrush, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Desert Sandy Loam (Blackbrush) range site.

61—Moffat loamy fine sand, 8 to 15 percent slopes. This very deep, well drained soil is on uplands, benches, and alluvial fans. It formed in alluvial and eolian material derived dominantly from sandstone. Slopes are concave to convex and are medium in length. The present vegetation in most areas is mainly blackbrush, galleta, Indian ricegrass, and Mormon-tea. Elevation is 4,500 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is light reddish brown loamy fine sand about 2 inches thick. The subsoil is light reddish brown fine sandy loam about 12 inches thick. The substratum to a depth of 60 inches or more is light reddish brown fine sandy loam. A layer of calcium carbonate accumulation is at a depth of 8 to 15 inches.

Included in this unit are about 10 percent Sheppard sand, hummocky; 5 percent Moenkopie fine sandy loam; and 5 percent Rock outcrop.

Permeability of the Moffat soil is moderately rapid. Available water capacity is about 5 to 7 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The potential plant community is 35 percent grasses, 15 percent forbs, and 50 percent shrubs. Important plants are Indian ricegrass, galleta, spike dropseed, mesa dropseed, blackbrush, shadscale, Mormon-tea, fourwing saltbush, rubber rabbitbrush, and shadscale.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Desert Sandy Loam (Blackbrush) range site.

62—Moffat-Sheppard complex. This map unit is on benches and in valleys. Slopes are 2 to 8 percent and are medium in length. The present vegetation in most areas is mainly Indian ricegrass, spike dropseed, blackbrush, Mormon-tea, and fourwing saltbush. The blackbrush is mainly on the Moffat soil. Elevation is 4,600 to 5,100 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 40 percent Moffat loamy fine sand, 2 to 8 percent slopes; 40 percent Sheppard loamy fine sand, 2 to 8 percent slopes; and 20 percent other soils and Rock outcrop.

Included in this unit are about 15 percent Travessilla channery sandy loam and 5 percent Rock outcrop.

The Moffat soil is very deep and well drained. It formed in alluvial and eolian deposits derived dominantly from sandstone. Typically, the surface layer is light reddish brown loamy fine sand about 2 inches thick. The subsoil is reddish brown fine sandy loam about 12 inches thick. The upper 31 inches of the substratum is pinkish white and pink fine sandy loam, and the lower part to a depth of 60 inches or more is light reddish brown fine sandy loam. A layer of calcium carbonate accumulation is at a depth of 8 to 15 inches.

Permeability of the Moffat soil is moderately rapid. Available water capacity is about 4.5 to 7.5 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.25 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Sheppard soil is very deep and somewhat excessively drained. It formed in eolian deposits derived dominantly from sandstone. Typically, the surface layer is light reddish brown loamy fine sand about 3 inches thick. The underlying material to a depth of 60 inches or more is reddish brown loamy fine sand.

Permeability of the Sheppard soil is rapid. Available water capacity is about 3.5 to 5.0 inches. Water supplying capacity is 3.5 to 5.0 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Moffat soil is 35 percent grasses, 15 percent forbs, and 50 percent shrubs. Important plants are Indian ricegrass, galleta, spike dropseed, blackbrush, and Mormon-tea.

The potential plant community on the Sheppard soil is 55 percent grasses, 20 percent forbs, and 25 percent shrubs. Important plants are Indian ricegrass, spike dropseed, sand dropseed, and fourwing saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the sandy texture of the Sheppard soil.

This map unit is in capability subclass VIIs, nonirrigated. The Moffat soil is in the Desert Sandy Loam (Blackbrush) range site, and the Sheppard soil is in the Desert Sand range site.

63—Montosa family, 4 to 8 percent slopes. These very deep, well drained soils are on alluvial fans and benches. They formed in alluvium derived dominantly from diorite. Slopes are undulating and short. The present vegetation in most areas is mainly Utah juniper, pinyon, sagebrush, and Indian ricegrass. Some areas have been chained and seeded to other species. Elevation is 6,500 to 7,500 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 45 to 47 degrees F, and the freeze-free period is 75 to 100 days.

No single profile of these soils is typical, but one commmonly observed in the survey area has a surface layer that is brown cobbly very fine sandy loam about 3 inches thick. The subsoil is brown very cobbly loam about 8 inches thick. The upper 41 inches of the substratum is brown very cobbly coarse sandy loam, and the lower part to a depth of 60 inches or more is pale brown extremely cobbly loamy coarse sand. A layer of calcium carbonate accumulation is at a depth of 11 to 20 inches.

Included in this unit are about 10 percent soils that do not have rock fragments, are 20 to 40 inches deep over shale, and are in narrow drainageways and 10 percent Montosa family soils that have slopes of as much as 30 percent.

Permeability of the Montosa family soils is moderate. Available water capacity is about 3 to 5 inches. Water supplying capacity is 6 inches. Effective rooting depth is

60 inches or more. The organic matter content of the surface layer is about 1 to 3 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used as woodland, rangeland, and wildlife habitat.

The potential plant community is 60 percent grasses, 5 percent forbs, and 35 percent shrubs. Important understory plants are blue grama, muttongrass, Nevada bluegrass, rock goldenrod, and green Mormon-tea. The overstory is pinyon and Utah juniper.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is fair. The main limitations are moderately low precipitation and the very cobbly texture of the soils. Undesirable plants can be controlled by chaining, burning, or spraying with chemicals. It is a good practice when broadcast seeding is used to cover the seed by pulling a Dixie harrow, anchor chain, or other similar equipment over the area. Plants other than native species that are suitable for seeding include Siberian wheatgrass, crested wheatgrass, Russian wildrye, and bluebunch wheatgrass.

This map unit is in capability subclass VIe, nonirrigated. It is in the Upland Stony Loam (Pinyon-Juniper) woodland site.

64—Monue loamy fine sand. This very deep, well drained soil is on alluvial terraces and upland plains. It formed in alluvium derived dominantly from sandstone. Slopes are 2 to 4 percent, are concave to convex, and are short. The present vegetation in most areas is mainly Mormon-tea, galleta, Indian ricegrass, and annual weeds. Elevation is 3,800 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 53 degrees F, and the freeze-free period is 140 to 170 days.

Typically, the surface layer is light reddish brown loamy fine sand about 3 inches thick. The subsoil is light reddish brown fine sandy loam about 8 inches thick. The substratum to a depth of 60 inches or more is light reddish brown fine sandy loam.

Included in this unit is about 10 percent Moffat loamy fine sand.

Permeability of the Monue soil is moderately rapid. Available water capacity is about 5.5 to 9.0 inches. Water supplying capacity is 3 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 50 percent grasses, 15 percent forbs, and 35 percent shrubs. Important plants are galleta, Indian ricegrass, dropseed, globemallow, winterfat, fourwing saltbush, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Desert Sandy Loam range site.

65—Monue Variant-Farb-Rock outcrop complex. This map unit is on mesas and benches. Slopes are 2 to 4 percent, are concave to convex, and are medium in length. The present vegetation in most areas is mainly galleta, Indian ricegrass, blackbrush, and fourwing saltbush. The blackbrush is on the Farb soil. Elevation is 4,800 to 4,900 feet. The average annual precipitation is about 6 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 50 percent Monue Variant fine sandy loam, 2 to 4 percent slopes; 30 percent Farb fine sandy loam, 2 to 4 percent slopes; 15 percent Rock outcrop; and 5 percent other soils.

Included in this unit is about 5 percent Hanksville clay loam.

The Monue soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from sandstone. Typically, the surface layer is light yellowish brown fine sandy loam about 8 inches thick. The subsoil is light yellowish brown fine sandy loam about 16 inches thick. The substratum is light yellowish brown loam about 15 inches thick. Sandstone is at a depth of 39 inches. A layer of calcium carbonate accumulation is at a depth of 24 to 30 inches. Depth to sandstone ranges from 20 to 40 inches.

Permeability of the Monue Variant soil is moderate to the restrictive layer. Available water capacity is about 3 to 5 inches. Water supplying capacity is 3 to 5 inches. Effective rooting depth is 20 to 40 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

The Farb soil is shallow and well drained. It formed in residuum derived dominantly from sandstone. Typically, the surface layer is light brown fine sandy loam about 3 inches thick. The underlying material to a depth of 12 inches is light brown fine sandy loam. Sandstone is at a

depth of 12 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Farb soil is moderately rapid to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Monue Variant soil is 50 percent grasses, 15 percent forbs, and 35 percent shrubs. Important plants are galleta, Indian ricegrass, dropseed, fourwing saltbush, Mormon-tea, and winterfat.

The potential plant community on the Farb soil is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, Mormon-tea, and blackbrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are the low precipitation, areas of Rock outcrop, and shallow depth of the Farb soil.

This map unit is in capability subclass VIIe, nonirrigated. The Monue Variant soil is in the Desert Sandy Loam range site, and the Farb soil is in the Desert Shallow Sandy Loam range site. Rock outcrop is not placed in a range site.

66—Myton family-Travessilla-Rock outcrop complex. This map unit is on mountainsides. Slopes are 15 to 70 percent, are concave to convex, and are short. The present vegetation in most areas is mainly shadscale, galleta, Indian ricegrass, and fourwing saltbush. Elevation is 5,200 to 6,500 feet. The average annual precipitation is about 8 to 11 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 50 percent Myton family soils, 50 to 70 percent slopes; 20 percent Travessilla fine sandy loam, 15 to 50 percent slopes; 20 percent Rock outcrop; and 10 percent other soils.

Included in this unit is about 10 percent Strych gravelly fine sandy loam.

The Myton family soils are very deep and well drained. They formed in colluvium and alluvium derived dominantly from sandstone and shale. No single profile of these soils is typical, but one commonly observed in the survey area has a surface layer of reddish brown extremely bouldery loam about 6 inches thick. The upper 24 inches of the underlying material is pinkish white very cobbly sandy loam, and the lower part to a depth of 60 inches or more is light reddish brown very cobbly sandy loam.

Permeability of the Myton family soils is moderately rapid. Available water capacity is about 3 to 5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is rapid, and the hazard of water erosion is high.

The Travessilla soil is shallow and well drained. It formed in residual and eolian material derived dominantly from sandstone. Typically, the surface layer is light yellowish brown fine sandy loam about 3 inches thick. The underlying material to a depth of 12 inches is light yellowish brown fine sandy loam. Sandstone is at a depth of 12 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Travessilla soil is moderately rapid to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 2 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as wildlife habitat and for limited use as rangeland.

The potential plant community on the Myton family soils is 40 percent grasses, 10 percent forbs, and 50 percent shrubs. Important plants are Salina wildrye, galleta, Indian ricegrass, blackbrush, Mormon-tea, and skunkbush sumac.

The potential plant community on the Travessilla soil is 35 percent grasses, 20 percent forbs, and 45 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, Mormon-tea, and Bigelow sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Because of the steepness of slope, grazing should be carefully managed to prevent overgrazing, which could result in excessive soil erosion. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, steepness of slope in some areas, the extremely bouldery surface layer of the Myton family soils, and the shallow depth of the Travessilla soil.

This map unit is in capability subclass VIIs, nonirrigated. The Myton family soils are in the Talus Slope range site, and the Travessilla soil is in the Semidesert Shallow Sandy Loam range site. Rock outcrop is not placed in a range site.

67—Olnes family, 50 to 70 percent slopes. These deep, well drained soils are on mountainsides that commonly face north. They formed in colluvium derived dominantly from diorite. Slopes are convex and short. The present vegetation in most areas is Engelmann spruce, Douglas-fir, quaking aspen, subalpine fir, big sagebrush, bluegrass, and snowberry. Elevation is 9,500 to 11,500 feet. The average annual precipitation is about 22 to 30 inches, the average annual air temperature is 33 to 38 degrees F, and the freeze-free period is 20 to 50 days.

No single profile of these soils is typical, but one commonly observed in the survey area has an organic mat about 4 inches thick on the surface. The surface layer is brown cobbly loam about 6 inches thick. The upper 30 inches of the underlying material is pink very cobbly loam, and the lower part to a depth of 59 inches is pink extremely cobbly loam. Diorite is at a depth of 59 inches. Depth to diorite ranges from 40 to 60 inches.

Included in this unit are about 10 percent Pando family soils, 10 percent Rogert Variant loam, and 5 percent Rogert very gravelly loam.

Permeability of the Olnes family soils is moderate. Available water capacity is about 4 to 7 inches. Water supplying capacity is 11 to 14 inches. Effective rooting depth is 40 to 60 inches. The organic matter content of the surface layer is about 2 to 3 percent. Runoff is slow, and the hazard of water erosion is slight.

This unit is used as woodland, rangeland, wildlife habitat, and watershed.

The potential overstory is Engelmann spruce. Important understory plants are sedge, pinegrass, blueberry, currant, and Oregon-grape.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is steepness of slope; however, for emergency erosion control following a fire or for other special needs, seeding could be done by aerial methods.

This map unit is in capability subclass VIIe, nonirrigated. It is in the High Mountain Stony Loam (Engelmann Spruce) woodland site.

68—Olnes-Pando families complex. This map unit is on mountainsides. Slopes are 50 to 70 percent, are concave to convex, and are short. The present vegetation in most areas is Engelmann spruce, subalpine fir, quaking apsen, Utah snowberry, elderberry, muttongrass, and Sandberg bluegrass. Elevation is 8,400 to 11,500 feet. The average annual precipitation is about 20 to 30 inches, the average annual air temperature is 32 to 38 degrees F, and the freeze-free period is 20 to 60 days.

This unit is 50 percent Olnes family soils, 50 to 70 percent slopes; 20 percent Pando family soils, 50 to 70 percent slopes; and 30 percent other soils and Rubble land.

Included in this unit are about 10 percent Rogert Variant loam, 10 percent Rogert very gravelly loam, and 10 percent Rubble land.

The Olnes family soils are deep and well drained. They formed in colluvium derived dominantly from diorite. No single profile of these soils is typical, but one commonly observed in the survey area has an organic mat about 4 inches thick on the surface. The surface layer is brown cobbly loam about 6 inches thick. The upper 30 inches of the underlying material is pink very cobbly loam, and the lower part to a depth of 59 inches is pink extremely cobbly loam. Diorite is at a depth of 59 inches. Depth to diorite ranges from 40 to 60 inches.

Permeability of the Olnes family soils is moderate. Available water capacity is about 4 to 7 inches. Water supplying capacity is 11 to 14 inches. Effective rooting depth is 40 to 60 inches. The organic matter content of the surface layer is about 2 to 3 percent. Runoff is slow, and the hazard of water erosion is slight.

The Pando family soils are deep and well drained. They formed in colluvium derived dominantly from diorite and shale. No single profile of these soils is typical, but one commonly observed in the survey area has a brown cobbly loam surface layer about 10 inches thick. The subsurface layer is light brownish gray very cobbly loam about 15 inches thick. The subsoil is yellowish brown very cobbly loam about 30 inches thick. Unweathered shale is at a depth of 55 inches. Depth to shale ranges from 40 to 60 inches.

Permeability of the Pando family soils is moderate. Available water capacity is about 4.5 to 6.0 inches. Water supplying capacity is 12 to 16 inches. Effective rooting depth is 40 to 60 inches. The organic matter content of the surface layer is about 3 to 6 percent. Runoff is medium, and the hazard of water erosion is moderate.

This unit is used as woodland, wildlife habitat, watershed, and rangeland.

The potential overstory on the Olnes family soils is Engelmann spruce and that on the Pando family soils is Douglas-fir. Important understory plants on the Olnes family soils are sedge, pinegrass, blueberry, currant, and Oregon-grape. The understory vegetation on the Pando family soils has not been determined.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Because of the steepness of slope, grazing in this unit should be carefully managed to prevent overgrazing, which could cause excessive soil erosion. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is steepness of slope; however, for emergency erosion control following a fire or for other special needs, seeding could be done by aerial methods.

This map unit is in capability subclass VIIe, nonirrigated. The Olnes family soils are in the High Mountain Stony Loam (Engelmann Spruce) woodland site, and the Pando family soils are in the High Mountain Stony Clay (Douglas-fir) woodland site.

69—Otero-Glenberg families complex. This map unit is on flood plains and terrace side slopes. The Glenberg family soils are on the flood plains, and the Otero family soils are on the terrace side slopes. Slopes are 0 to 4 percent and are medium in length. The present vegetation in most areas is mainly galleta, sand dropseed, alkali sacaton, and fourwing saltbush. Elevation is 4,600 to 6,000 feet. The average annual precipitation is about 6 to 10 inches, the average annual air temperature is 48 to 52 degrees F, and the freeze-free period is 120 to 160 days.

This unit is 40 percent Otero family soils, 2 to 4 percent slopes; 40 percent Glenberg family soils, 0 to 4 percent slopes; and 20 percent other soils and Badland.

Included in this unit are about 5 percent Chipeta silty clay, 5 percent Mido loamy fine sand, 5 percent Travessilla channery sandy loam, and 5 percent Badland.

The Otero family soils are very deep and well drained. They formed in alluvium derived dominantly from sandstone and shale. No single profile is typical of these soils, but one commonly observed in the survey area has a surface layer that is yellowish red fine sandy loam about 5 inches thick. The underlying material to a depth of 60 inches or more is yellowish red fine sandy loam.

Permeability of the Otero family soil is moderately rapid. Available water capacity is about 6.0 to 8.5 inches. Water supplying capacity is 3 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

The Glenberg family soils are very deep and well drained. They formed in alluvium derived dominantly from sandstone and shale. No single profile is typical of these soils, but one commonly observed in the survey area has a surface layer that is light yellowish brown fine sandy loam about 3 inches thick. The upper 20 inches of the underlying material is light yellowish brown loam, and the lower part to a depth of 60 inches or more is light yellowish brown fine sandy loam and very fine sandy loam. These soils are highly stratified.

Permeability of the Glenberg family soils is moderate. Available water capacity is about 6 to 9 inches. Water supplying capacity is 3 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate. These soils are rarely flooded.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Otero family soils is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are Indian ricegrass, needleandthread, galleta, fourwing saltbush, and winterfat.

The potential plant community on the Glenberg family soils is 70 percent grasses, 15 percent forbs, and 15 percent shrubs. Important plants are galleta, Indian ricegrass, mesa dropseed, needleandthread, globemallow, and fourwing saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIe, nonirrigated. The Otero family soils are in the Semidesert Sandy Loam range site, and the Glenberg family soils are in the Sandy Bottom range site.

70—Palma very fine sandy loam. This very deep, well drained soil is on high mesas. It formed in alluvium and residuum derived dominantly from sandstone. Slopes are 2 to 4 percent and are long. The present vegetation in most areas is mainly Indian ricegrass, blue grama, galleta, shadscale, Mormon-tea, big sagebrush, and juniper. Some areas have been chained and seeded to other species. Elevation is 5,600 to 6,800 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 115 to 140 days.

Typically, the surface layer is brown very fine sandy loam about 5 inches thick. The subsoil is strong brown very fine sandy loam about 31 inches thick. The substratum to a depth of 60 inches or more is light brown and brown very fine sandy loam. A layer of

calcium carbonate accumulation is at a depth of 36 to 45 inches.

Included in this unit are about 10 percent Wayneco fine sand, 5 percent Windwhistle very loamy fine sand, and 5 percent Rock outcrop.

Permeability of the Palma soil is moderately rapid. Available water capacity is about 7.0 to 8.5 inches. Water supplying capacity is 6 to 7 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are needleandthread, Indian ricegrass, galleta, winterfat, and fourwing saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is poor. The main limitation is the moderately low precipitation.

Undesirable plants can be controlled by spraying with chemicals, chaining, or plowing. Drilling of seed is preferable and results in better stands of forage. If broadcast seeding is used, it is a good practice to cover the seed by pulling a Dixie harrow, anchor chain, or other similar equipment over the area. Plants other than native species that are suitable for seeding include Siberian wheatgrass, crested wheatgrass, Russian wildrye, fourwing saltbush, and winterfat.

This map unit is in capability subclass VIe, nonirrigated. It is in the Semidesert Sandy Loam range site.

71—Pando family-Rogert complex. This map unit is in very steep areas on mountainsides. Slopes are 50 to 70 percent and are short. The present vegetation in most areas is mainly Douglas-fir, quaking aspen, currant, muttongrass, Salina wildrye, black sagebrush, birchleaf mountainmahogany, and antelope bitterbrush. The average annual precipitation is about 20 to 30 inches, the average annual air temperature is 32 to 38 degrees F, and the freeze-free period is 10 to 40 days.

This unit is 35 percent Pando family soils, 50 to 70 percent slopes; 35 percent Rogert very gravelly loam, 50 to 70 percent slopes; and 30 percent other soils and Rubble land.

Included in this unit are about 15 percent Rogert Variant loam, 10 percent Olnes family soils, and 5 percent Rubble land.

The Pando family soils are deep and well drained. They formed in colluvium derived dominantly from diorite and shale. No single profile of these soils is typical, but one commonly observed in the survey area has a surface layer that is brown cobbly loam about 10 inches thick. The subsurface layer is light brownish gray very cobbly loam about 15 inches thick. The subsoil is yellowish brown very cobbly loam about 30 inches thick. Unweathered shale is at a depth of 55 inches. Depth to shale ranges from 40 to 60 inches.

Permeability of the Pando family soils is moderate. Available water capacity is about 4.5 to 5.0 inches. Water supplying capacity is 12 to 16 inches. Effective rooting depth is 40 to 60 inches. The organic matter content of the surface layer is about 3 to 5 percent. Runoff is medium, and the hazard of water erosion is moderate.

The Rogert soil is shallow and well drained. It formed in colluvium and residuum derived dominantly from diorite. Typically, the surface layer is dark grayish brown very gravelly loam about 9 inches thick. The underlying material to a depth of 18 inches is brown very gravelly loam. Fractured diorite is at a depth of 18 inches. Depth to diorite ranges from 10 to 20 inches.

Permeability of the Rogert soil is moderately rapid to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 7 to 10 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 3 to 6 percent. Runoff is medium, and the hazard of water erosion is moderate.

This unit is used as rangeland, woodland, wildlife habitat, and watershed.

The potential overstory on the Pando family soils is Douglas-fir. The understory has not yet been determined.

The potential plant community on the Rogert soil is 50 percent grasses, 15 percent forbs, and 35 percent shrubs. Important plants are Salina wildrye, bluebunch wheatgrass, bluegrass, and black sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Because of the steepness of slope, grazing should be carefully managed to prevent overgrazing, which could cause excessive soil erosion. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is steepness of slope; however, for emergency erosion control following a fire or for other special needs, seeding could be done by aerial methods.

This map unit is in capability subclass VIIs, nonirrigated. The Pando family soils are in the High Mountain Stony Clay (Douglas-fir) woodland site, and the

Rogert soil is in the Mountain Shallow Loam (Black Sagebrush) range site.

72—Pastern cobbly fine sandy loam, 2 to 15 percent slopes. This shallow, well drained soil is on alluvial fans and fan terraces. It formed in alluvium derived dominantly from sandstone. Slopes are concave to convex and are medium in length. The present vegetation in most areas is mainly blackbrush, Mormon-tea, cliffrose, and broom snakeweed. Elevation is 5,500 to 6,200 feet. The average annual precipitation is about 8 to 11 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is yellowish red cobbly fine sandy loam about 4 inches thick. The upper 5 inches of the underlying material is light reddish brown gravelly loam, and the lower part to a depth of 15 inches is pink gravelly loam. An indurated lime-cemented hardpan is at a depth of 15 inches. A layer of calcium carbonate accumulation is at a depth of 4 to 6 inches. Depth to the hardpan ranges from 10 to 20 inches.

Included in this unit is about 20 percent Rizno channery fine sandy loam.

Permeability of the Pastern soil is moderate to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 15 percent grasses, 25 percent forbs, and 60 percent shrubs. Important plants are blackbrush, Indian ricegrass, galleta, and Bigelow sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow depth of the soil.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Semidesert Shallow Sandy Loam (Blackbrush) range site.

73—Pennell fine sandy loam, 2 to 8 percent slopes. This shallow, well drained soil is on benches and uplands. It formed in residuum derived dominantly from sandstone. Slopes are convex and are medium in length. The present vegetation in most areas is mainly galleta, shadscale, broom snakeweed, and blackbrush. Elevation is 4,500 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is light brown fine sandy loam about 4 inches thick. The upper 5 inches of the underlying material is pink gravelly sandy loam, and the lower part to a depth of 15 inches is pink channery sandy loam. Sandstone is at a depth of 15 inches. A layer of calcium carbonate accumulation is at a depth of 4 to 9 inches. Depth to sandstone ranges from 10 to 20 inches.

Included in this unit is about 10 percent Rock outcrop. Also included are small areas of Sheppard loamy fine sand and Pennell channery fine sandy loam.

Permeability of the Pennell soil is moderate to the restrictive layer. Available water capacity is about 1.5 to 3.0 inches. Water supplying capacity is 2 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, Mormon-tea, and blackbrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are the low precipitation and shallow depth of the soil.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Desert Shallow Sandy Loam range site.

74—Pennell-Moenkopie-Rock outcrop complex, 2 to 15 percent slopes. This map unit is on mesas and benches. Slopes are 2 to 15 percent, are convex, and are medium in length. The present vegetation in most areas is mainly blackbrush, broom snakeweed, Mormon-tea, shadscale, and galleta. The blackbrush grows mainly on the Moenkopie soil. Elevation is 4,800 to 5,200 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 53 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 40 percent Pennell fine sandy loam, 2 to 8 percent slopes; 35 percent Moenkopie fine sandy loam, 4 to 15 percent slopes; 10 percent Rock outcrop; and 15 percent other soils.

Included in this unit are about 10 percent Sheppard loamy fine sand and 5 percent Glenberg family soils that are in drainageways.

The Pennell soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from sandstone and siltstone. Typically, the surface layer is yellowish red fine sandy loam about 3 inches thick. The upper 5 inches of the underlying material is reddish yellow fine sandy loam, and the lower part to a depth of 15 inches is pink channery loam. Sandstone is at a depth of 15 inches. A layer of calcium carbonate accumulation is at a depth of 4 to 9 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Pennell soil is moderate to the restrictive layer. Available water capacity is about 1.5 to 4.0 inches. Water supplying capacity is 2 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

The Moenkopie soil is very shallow and well drained. It formed in residuum derived dominantly from sandstone and siltstone. Typically, the surface layer is reddish brown fine sandy loam about 1 inch thick. The upper 5 inches of the underlying material is reddish brown fine sandy loam, and the lower part to a depth of 9 inches is light reddish brown fine sandy loam. Sandstone is at a depth of 9 inches. Depth to sandstone ranges from 5 to 10 inches.

Permeability of the Moenkopie soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 to 1.5 inches. Water supplying capacity is 2 inches. Effective rooting depth is 5 to 10 inches. The organic matter content of the surface layer is about 0.25 to 1.00 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Pennell soil is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, Mormon-tea, and blackbrush.

The potential plant community on the Moenkopie soil is 15 percent grasses, 10 percent forbs, and 75 percent shrubs. Important plants are blackbrush, Mormon-tea, shadscale, galleta, and Indian ricegrass.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the shallow and very shallow depth of the soils, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Pennell soil is in the Desert Shallow Sandy Loam range site, and the Moenkopie soil is in the Desert Very Shallow Sandy Loam (Blackbrush) range site. Rock outcrop is not placed in a range site.

75—Pennell-Moenkopie-Rock outcrop complex, 15 to 50 percent slopes. This map unit is on mesas and hillsides. Slopes are concave to convex and are short. The present vegetation in most areas is mainly blackbrush, Indian ricegrass, galleta, and broom snakeweed. The blackbrush is mostly on the Moenkopie soil. Elevation is 4,500 to 5,200 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 53 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 40 percent Pennell fine sandy loam, 15 to 50 percent slopes; 40 percent Moenkopie fine sandy loam, 15 to 50 percent slopes; 10 percent Rock outcrop; and 10 percent other soils.

Included in this unit are about 5 percent Sheppard loamy fine sand and 5 percent Neskahi family soils in drainageways.

The Pennell soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from sandstone and siltstone. Typically, the surface layer is yellowish red fine sandy loam about 4 inches thick. The upper 4 inches of the underlying material is yellowish red fine sandy loam, and the lower part to a depth of 14 inches is pink gravelly sandy loam. Sandstone is at a depth of 14 inches. A layer of calcium carbonate accumulation is at a depth of 4 to 9 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Pennell soil is moderate to the restrictive layer. Available water capacity is about 1 inch to 3 inches. Water supplying capacity is 2 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

The Moenkopie soil is very shallow and well drained. It formed in residuum derived dominantly from sandstone and siltstone. Typically, the surface layer is yellowish red fine sandy loam about 2 inches thick. The upper 4 inches of the underlying material is reddish yellow fine sandy loam, and the lower part to a depth of 9 inches is pink fine sandy loam. Sandstone is at a depth of 9 inches. Depth to sandstone ranges from 5 to 10 inches.

Permeability of the Moenkopie soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 to 1.5 inches. Water supplying capacity is 2 inches. Effective rooting depth is 5 to 10 inches. The organic matter content of the surface layer is about 0.25 to 1.00 percent. Runoff is medium, and the hazard of water

erosion is moderate. The hazard of soil blowing is moderate.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Pennell soil is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, Mormon-tea, and blackbrush.

The potential plant community on the Moenkopie soil is 15 percent grasses, 10 percent forbs, and 75 percent shrubs. Important plants are blackbrush, Mormon-tea, shadscale, galleta, and Indian ricegrass.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Because of the steepness of slope, grazing should be carefully managed to prevent overgrazing, which could cause excessive soil erosion. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the shallow and very shallow depth of the soils, steepness of slope, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Pennell soil is in the Desert Shallow Sandy Loam range site, and the Moenkopie soil is in the Desert Very Shallow Sandy Loam (Blackbrush) range site. Rock outcrop is not placed in a range site.

76—Redcreek-Windwhistle Variant complex. This map unit is on mesas. Slopes are 2 to 8 percent and are medium in length. The present vegetation in most areas is mainly Indian ricegrass, Bigelow sagebrush, birchleaf mountainmahogany, pinyon, and Utah juniper. Some areas of these soils have been chained and seeded to crested wheatgrass. Elevation is 6,000 to 7,000 feet. The average annual precipitation is about 10 to 13 inches, the average annual air temperature is 40 to 45 degrees F, and the freeze-free period is 75 to 100 days.

This unit is 40 percent Redcreek fine sandy loam, 2 to 8 percent slopes; 40 percent Windwhistle Variant very fine sandy loam, 2 to 8 percent slopes; and 20 percent other soils and Rock outcrop.

Included in this unit are about 10 percent Begay fine sandy loam and 10 percent soils that are shallow to shale. Also included are small areas of Rock outcrop.

The Redcreek soil is shallow and well drained. It formed in residuum derived dominantly from sandstone. Typically, the surface layer is reddish brown fine sandy loam about 5 inches thick. The substratum is reddish brown fine sandy loam about 9 inches thick. Sandstone is at a depth of 14 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Redcreek soil is moderately rapid to the restrictive layer. Available water capacity is about 1.5 to 2.5 inches. Water supplying capacity is 3 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 1 to 3 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

The Windwhistle Variant soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from sandstone. Typically, the surface layer is reddish brown very fine sandy loam 7 inches thick. The subsoil is reddish brown fine sandy loam 7 inches thick. The substratum is reddish brown fine sandy loam 12 inches thick over sandstone. Depth to sandstone ranges from 20 to 40 inches.

Permeability of the Windwhistle Variant soil is moderate to the restrictive layer. Available water capacity is about 2.5 to 3.5 inches. Water supplying capacity is 6 inches. Effective rooting depth is 20 to 30 inches. The organic matter content of the surface layer is about 2 to 3 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 50 percent grasses, 10 percent forbs, and 40 percent shrubs. Important understory plants are Bigelow sagebrush, Mormon-tea, galleta, bluegrass, and Indian ricegrass. Overstory vegetation is pinyon and Utah juniper.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is poor. The main limitations are moderately low precipitation, the moderate depth of the Windwhistle Variant soil, and the shallow depth of the Redcreek soil. Undesirable plants can be controlled by chaining, burning, or spraying with chemicals. It is a good practice when broadcast seeding is used to cover the seed by pulling a Dixie harrow, anchor chain, or other similar equipment over the area. Plants other than native species that are suitable for seeding include Siberian wheatgrass, crested wheatgrass, Russian wildrye, and bluebunch wheatgrass.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Upland Shallow Loam (Pinyon-Juniper) woodland site.

77—Riverwash. Riverwash consists of unstabilized sandy, silty, or gravelly material that has been flooded,

washed, and reworked by rivers or streams so frequently that it can support little if any vegetation.

This map unit is in capability subclass VIIIw. It is not placed in a range site.

78—Riverwash-Glenberg-Green River families complex. This map unit is on alluvial flood plains of the Fremont, Muddy, and Dirty Devil Rivers. Slopes are 0 to 4 percent and are short. The present vegetation in most areas is mainly saltcedar, buffaloberry, yellowbrush, saltgrass, greasewood, wiregrass, willows, and cottonwood trees. Elevation is 3,800 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 40 percent Riverwash; 30 percent Glenberg family soils, wet, 0 to 4 percent slopes; and 30 percent Green River family soils, 0 to 2 percent slopes.

Riverwash is unstabilized sandy, silty, or gravelly sediment that has been flooded, washed, and reworked by rivers or streams so frequently that it supports little if any vegetation.

The Glenberg family soils are very deep and moderately well drained. They formed in alluvium derived dominantly from mixed river sediment. No single profile is typical of these soils, but one commonly observed in the survey area has a surface layer of brown fine sandy loam about 3 inches thick. The upper 20 inches of the underlying material is light yellowish brown loam, and the lower part to a depth of 60 inches or more is light yellowish brown fine sandy loam and very fine sandy loam. These soils are stratified with textures ranging from sand to clay, but they commonly are sandy loam to very fine sandy loam. The water table usually is below a depth of 40 inches. The soils are moderately saline.

Permeability of the Glenberg family soils is moderate. Available water capacity is about 7.0 to 10.5 inches. Water supplying capacity is 6 to 8 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate. These soils are occasionally flooded in summer.

The Green River family soils are very deep and poorly drained. They formed in alluvium derived dominantly from sandstone and shale. No single profile is typical of these soils, but one commonly observed in the survey area has a surface layer of light yellowish brown loamy fine sand about 6 inches thick. The subsoil is pale brown fine sandy loam that has few, fine, faint mottles and is about 14 inches thick. The upper 20 inches of the underlying material is light yellowish brown gravelly sandy loam, and the lower part to a depth of 60 inches or more is light yellowish brown loam. These soils are highly stratified. They are moderately saline or strongly saline.

Permeability of the Green River family soils is moderately rapid. Available water capacity is about 5.5 to 8.5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 3.0 percent. Runoff is slow, and the hazard of water erosion is slight. The water table is at a depth of about 20 to 40 inches during the summer. These soils are occasionally flooded during the summer.

This unit is used as wildlife habitat and rangeland. This is an important wildlife site because of the easy access to water.

The potential plant community on the Glenberg family soils is 85 percent grasses and 15 percent shrubs. Important plants are black greasewood, seepweed, sand dropseed, and alkali sacaton.

The potential plant community on the Green River family soils is 60 percent grasses, 10 percent forbs, and 30 percent shrubs. Important plants are alkali sacaton, inland saltgrass, Indian ricegrass, coyote willow, and Fremont cottonwood.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Suitability for seeding is very poor. The main limitations are low precipitation, the saline condition of the soils, and the hazard of flooding.

This map unit is in capability subclass VIIw, nonirrigated. The Glenberg family soils are in the Alkali Bottom range site, and the Green River family soils are in the Semiwet Salt Streambank range site. Riverwash is not placed in a range site.

79—Riverwash-Neskahi family complex. This map unit is on the flood plains of major stream channels. Slopes are 0 to 4 percent and are short. The present vegetation in most areas is mainly areas of greasewood, saltcedar, rabbitbrush, and annual weeds. Elevation is 4,000 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 45 percent Riverwash; 35 percent Neskahi family soils, 0 to 4 percent slopes; and 20 percent other soils.

Included in this unit are 10 percent Glenberg family soils, wet, and 10 percent Green River family soils.

Riverwash consists of unstabilized sandy, silty, or gravelly material that is flooded, washed, and reworked by rivers or streams so frequently that it supports little if any vegetation.

The Neskahi family soils are very deep and well drained. They formed in alluvium derived dominantly from sandstone and shale. No single profile of these soils is typical, but one commonly observed in the survey area has a light reddish brown fine sandy loam surface

layer about 4 inches thick. The upper 9 inches of the underlying material is light reddish brown very fine sandy loam, and the lower part to a depth of 60 inches or more is light reddish brown, stratified fine sandy loam and silt loam. In some areas the soils are strongly saline.

Permeability of the Neskahi family soils is moderate. Available water capacity is about 5.5 to 11.5 inches. Water supplying capacity is 3 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat. This is an important wildlife site because of easy access to water.

The potential plant community on the Neskahi family soils is 40 percent grasses, 20 percent forbs, and 40 percent shrubs. Important plants are black greasewood, bottlebrush squirreltail, galleta, and alkali sacaton.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the salinity of the soils.

This map unit is in capability subclass VIIs, nonirrigated. The Neskahi family soils are in the Alkali Flat range site. Riverwash is not placed in a range site.

80—Rizno fine sandy loam, 4 to 15 percent slopes. This shallow, well drained soil is on benches, mesas, and hillsides. It formed in residual and eolian material derived dominantly from sandstone. Slopes are convex and are medium in length. The present vegetation in most areas is mainly blackbrush, Mormon-tea, Indian ricegrass, and galleta. Elevation is 5,000 to 6,000 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 130 to 150 days.

Typically, the surface layer is yellowish red fine sandy loam about 4 inches thick. The upper 6 inches of the underlying material is yellowish red fine sandy loam, and the lower part to a depth of 18 inches is light reddish brown channery loam. Sandstone is at a depth of 18 inches. Depth to sandstone ranges from 10 to 20 inches.

Included in this unit are about 10 percent Begay fine sandy loam, 10 percent Mido loamy fine sand, and 15 percent Rock outcrop.

Permeability of the Rizno soil is moderately rapid to the restrictive layer. Available water capacity is about 1.0 inch to 2.5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 15 percent grasses, 25 percent forbs, and 60 percent shrubs. Important plants are blackbrush, Indian ricegrass, galleta, and Bigelow sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow depth of the soil.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Semidesert Shallow Sandy Loam (Blackbrush) range site.

81—Rizno-Mido complex. This map unit is on mesas and benches. Slopes are 4 to 15 percent, are concave to convex, and are long. The present vegetation in most areas is mainly blackbrush, Mormon-tea, galleta, Indian ricegrass, dropseed, and a few Utah juniper. The blackbrush grows mainly on the Rizno soil. Elevation is 5,000 to 6,400 feet. The average annual precipitation is about 8 to 12 inches, the average annual air temperature is 45 to 50 degrees F, and the freeze-free period is 130 to 140 days.

This unit is 50 percent Rizno fine sandy loam, 4 to 15 percent slopes; 40 percent Mido loamy fine sand, dry, 4 to 15 percent slopes, severely eroded; and 10 percent other soils and Rock outcrop.

Included in this unit are about 5 percent Moenkopie fine sandy loam and 5 percent Rock outcrop.

The Rizno soil is shallow and well drained. It formed in residuum and eolian material derived dominantly from sandstone. Typically, the surface layer is yellowish red fine sandy loam about 4 inches thick. The upper 6 inches of the underlying material is yellowish red fine sandy loam, and the lower part to a depth of 18 inches is light reddish brown channery loam. Sandstone is at a depth of 18 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Rizno soil is moderately rapid to the restrictive layer. Available water capacity is about 1.0 to 2.5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate.

The Mido soil is very deep and excessively drained. It formed in eolian deposits derived dominantly from sandstone. Typically, the profile is yellowish red loamy fine sand to a depth of 60 inches or more.

Permeability of the Mido soil is rapid. Available water capacity is about 3 to 5 inches. Water supplying capacity is 3.5 to 6.0 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Rizno soil is 15 percent grasses, 25 percent forbs, and 60 percent shrubs. Important plants are blackbrush, Indian ricegrass, galleta, and Bigelow sagebrush.

The potential plant community on the Mido soil is 50 percent grasses, 20 percent forbs, and 30 percent shrubs. Important plants are Indian ricegrass, dropseed, galleta, needleandthread, fourwing saltbush, Mormon-tea, and sand sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation, the shallow depth of the Rizno soil, and the sandy texture of the Mido soil.

This map unit is in capability subclass VIIs, nonirrigated. The Rizno soil is in the Semidesert Shallow Sandy Loam (Blackbrush) range site, and the Mido soil is in the Semidesert Sand range site.

82—Rizno-Rock outcrop complex. This map unit is on hillsides. Slopes are 4 to 30 percent, are convex, and are medium in length. The present vegetation in most areas is mainly Utah juniper, pinyon, Mormon-tea, blackbrush, and Indian ricegrass. Elevation is 5,400 to 6,400 feet. The average annual precipitation is about 8 to 12 inches, the average annual air temperature is 45 to 50 degrees F, and the freeze-free period is 130 to 150 days.

This unit is 75 percent Rizno channery fine sandy loam, 4 to 30 percent slopes, eroded; 20 percent Rock outcrop; and 5 percent other soils.

Included in this unit is about 5 percent Mido loamy fine sand, dry.

The Rizno soil is shallow and well drained. It formed in residual and eolian material derived dominantly from sandstone. Typically, the surface layer is red channery fine sandy loam about 3 inches thick. The underlying material to a depth of 11 inches is red channery fine sandy loam. Sandstone is at a depth of 11 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Rizno soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 inch to 1.5 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Rizno soil is 15 percent grasses, 20 percent forbs, and 65 percent shrubs. Important understory plants are galleta, Indian ricegrass, blackbrush, and Mormon-tea. The overstory is Utah juniper and pinyon.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the shallow depth of the soil, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Rizno soil is in the Semidesert Shallow Sandy Loam (Juniper-Pinyon) woodland site. Rock outcrop is not placed in a range site.

83—Rizno, warm-Rock outcrop complex. This map unit is on benches, mesas, and hillsides. Slopes are 4 to 15 percent, are convex, and are medium in length. The present vegetation in most areas is mainly blackbrush, Mormon-tea, broom snakeweed, Indian ricegrass, and scattered juniper. Elevation is 5,000 to 6,300 feet. The average annual precipitation is about 8 to 12 inches, the average annual air temperature is 45 to 50 degrees F, and the freeze-free period is 130 to 150 days.

This unit is 55 percent Rizno fine sandy loam, 4 to 15 percent slopes; 25 percent Rock outcrop; and 20 percent other soils.

Included in this unit are about 10 percent Mido loamy fine sand, dry; 5 percent Mellenthin gravelly fine sandy loam on hillsides; and 5 percent soils that are similar to the Rizno soil but are very shallow over sandstone.

The Rizno soil is shallow and well drained. It formed in residual and eolian material derived dominantly from sandstone. Typically, the surface layer is light reddish brown fine sandy loam about 3 inches thick. The underlying material to a depth of 17 inches is light reddish brown fine sandy loam. Sandstone is at a depth

of 17 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Rizno soil is moderately rapid to the restrictive layer. Available water capacity is about 1.5 to 2.5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

Rock outcrop consists of barren or nearly barren areas of exposed bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Rizno soil is 15 percent grasses, 25 percent forbs, and 60 percent shrubs. Important plants are blackbrush, Indian ricegrass, galleta, and Bigelow sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the shallow depth of the soil, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Rizno soil is in the Semidesert Shallow Sandy Loam (Blackbrush) range site. Rock outcrop is not placed in a range site.

84—Robroost-Goblin complex. This map unit is on upland valley plains, alluvial fans, and hillsides. Slopes are 2 to 30 percent, are concave to convex, and are short. The present vegetation in most areas is mainly shadscale, broom snakeweed, galleta, and Mormon-tea. Elevation is 4,500 to 4,700 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 70 percent Robroost fine sandy loam, 2 to 4 percent slopes, eroded; 15 percent Goblin loam, 2 to 30 percent slopes, severely eroded; and 15 percent other soils and Badland.

Included in this unit are about 10 percent soils that are redder and are shallow to shale and 5 percent Badland.

The Robroost soil is very deep and well drained. It formed in alluvium derived dominantly from gypsiferous shale and sandstone. Typically, the surface layer is light reddish brown fine sandy loam about 5 inches thick. The subsoil is light reddish brown loam about 5 inches thick. The substratum to a depth of 60 inches or more is light reddish brown loam. A layer of gypsum accumulation is between depths of 10 and 60 inches.

Permeability of the Robroost soil is moderate. Available water capacity is about 6.5 to 9.0 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

The Goblin soil is very shallow and shallow and is well drained. It formed in residuum and alluvium derived dominantly from gypsiferous shale and sandstone. Typically, the surface layer is light reddish brown loam about 3 inches thick. The underlying material to a depth of 12 inches is red loam. Gypsiferous shale is at a depth of 12 inches. Depth to shale ranges from 5 to 20 inches.

Permeability of the Goblin soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 inch to 2.0 inches. Water supplying capacity is 2 inches. Effective rooting depth is 4 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Robroost soil is 40 percent grasses, 20 percent forbs, and 40 percent shrubs. Important plants are galleta, shadscale, Torrey Mormon-tea, and locoweed.

The potential plant community on the Goblin soil is 25 percent grasses, 15 percent forbs, and 60 percent shrubs. Important plants are galleta, Indian ricegrass, Torrey Mormon-tea, club eriogonum, and shadscale.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow and very shallow depth of the Goblin soil.

This map unit is in capability subclass VIIe, nonirrigated. The Robroost soil is in the Desert Gypsum Loam range site, and the Goblin soil is in the Desert Very Shallow Gypsum range site.

85—Robroost-Goblin complex, eroded. This map unit is on upland valley plains, alluvial fans, and hillsides (fig. 2). Slopes are 2 to 30 percent, are concave to convex, and are short. The present vegetation in most areas is mainly Mormon-tea, shadscale, and eriogonum. Elevation is 4,600 to 4,800 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 65 percent Robroost fine sandy loam, 4 to 15 percent slopes, severely eroded; 25 percent Goblin loam, 2 to 30 percent slopes, severely eroded; and 10 percent other soils.

Included in this unit are about 5 percent Chipeta silty clay and 5 percent Neskahi family soils.

The Robroost soil is very deep and well drained. It formed in alluvium derived dominantly from gypsiferous shale and sandstone. Typically, the surface layer is reddish brown fine sandy loam about 4 inches thick. The upper 36 inches of the underlying material is pink loam, and the lower part to a depth of 60 inches or more is light reddish brown loam. A layer of gypsum accumulation is between depths of 4 and 30 inches.

Permeability of the Robroost soil is moderate. Available water capacity is about 6.5 to 9.0 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is medium.

The Goblin soil is very shallow and shallow and is well drained. It formed in residuum and alluvium derived dominantly from gypsiferous shale and sandstone. Typically, the surface layer is light reddish brown loam about 3 inches thick. The underlying material to a depth of 12 inches is red loam. Gypsiferous shale is at a depth of 12 inches. Depth to shale ranges from 5 to 20 inches.

Permeability of the Goblin soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 inch to 2.0 inches. Water supplying capacity is 2 inches. Effective rooting depth is 4 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Robroost soil is 40 percent grasses, 20 percent forbs, and 40 percent shrubs. Important plants are galleta, shadscale, Torrey Mormon-tea, and locoweed.

The potential plant community on the Goblin soil is 25 percent grasses, 15 percent forbs, and 60 percent

Figure 2.—Typical area of Robroost-Goblin complex, eroded.

shrubs. Important plants are galleta, Indian ricegrass, Torrey Mormon-tea, club eriogonum, and shadscale.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow and very shallow depth of the Goblin soil.

This map unit is in capability subclass VIIe, nonirrigated. The Robroost soil is in the Desert Gypsum Loam range site, and the Goblin soil is in the Desert Very Shallow Gypsum range site.

86—Rock outcrop. Rock outcrop consists of barren or nearly barren areas of exposed bedrock. It occurs mainly as nearly vertical cliffs and ledges.

Included in this unit are about 5 percent Travessilla channery sandy loam, 5 percent Moenkopie fine sandy loam, 5 percent Rubble land, and 5 percent Badland.

Rock outcrop supports little if any vegetation. The present vegetation on the included soils is Mormon-tea, rabbitbrush, Indian ricegrass, and Utah juniper.

This map unit is in capability subclass VIIIs. It is not placed in a range site.

87—Rock outcrop-Arches complex. This map unit is on hillsides. Slopes are 8 to 30 percent, are concave to convex, and are short. The present vegetation in most areas is mainly very sparse Utah juniper, pinyon, Mormon-tea, galleta, and Indian ricegrass. Elevation is 6,000 to 6,400 feet. The average annual precipitation is about 9 to 11 inches, the average annual air temperature is 45 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 65 percent Rock outcrop; 20 percent Arches loamy fine sand, 8 to 30 percent slopes, eroded; and 15 percent other soils.

Included in this unit are about 10 percent Mido loamy fine sand and 5 percent soils that are similar to the Arches soil but are 20 to 40 inches deep over sandstone and are in concave areas.

Rock outcrop consists of barren or nearly barren areas of exposed bedrock. It occurs mainly as nearly vertical cliffs and ledges.

The Arches soil is shallow and excessively drained. It formed in eolian deposits and residuum derived dominantly from sandstone. Typically, the surface layer is yellowish red loamy fine sand about 4 inches thick. The underlying material to a depth of 14 inches is yellowish red loamy fine sand. Sandstone is at a depth of 14 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Arches soil is rapid to the restrictive layer. Available water capacity is about 1.0 inch to 1.5 inches. Water supplying capacity is 2 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is high.

This unit is used mainly for wildlife habitat. It has very limited use as rangeland.

The potential plant community on the Arches soil is 35 percent grasses, 20 percent forbs, and 45 percent shrubs. The understory is galleta, Indian ricegrass, eriogonum, fourwing saltbush, and Mormon-tea. The overstory is Utah juniper and pinyon.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are the shallow depth of the soil, low precipitation, and the areas of Rock outcrop.

This map unit is in capability subclass VIII. The Arches soil is in the Semidesert Shallow Sand (Juniper-Pinyon) woodland site. Rock outcrop is not placed in a range site.

88—Rock outcrop-Chipeta complex. This map unit is on remnant mesas and benches. Slopes are 2 to 15 percent, are convex, and are short. The present vegetation in most areas is mainly mat saltbush, deserttrumpet, and galleta. Elevation is 4,500 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 50 percent Rock outcrop; 40 percent Chipeta silty clay, 2 to 15 percent slopes, severely eroded; and 10 percent Badland.

Included in this unit is about 10 percent Badland.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

The Chipeta soil is shallow and well drained. It formed in residuum derived dominantly from shale. Typically, the surface layer is light olive brown silty clay about 1 inch thick. The underlying material to a depth of 19 inches is grayish brown silty clay. Shale is at a depth of 19 inches. Depth to shale ranges from 10 to 20 inches.

Permeability of the Chipeta soil is slow to the restrictive layer. Available water capacity is about 2 to 3 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 2.0

percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used mainly as wildlife habitat. Few if any areas are used as rangeland.

The potential plant community on the Chipeta soil is 20 percent grasses, 20 percent forbs, and 60 percent shrubs. Important plants are mat saltbush, galleta, Indian ricegrass, and deserttrumpet.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the shallow depth of the soil, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs. The Chipeta soil is in the Desert Shallow Clay range site. Rock outcrop is not placed in a range site.

89—Rock outcrop-Chipeta-Canyon family complex. This map unit is on benches, mesas, and hillsides. Slopes are 8 to 30 percent, are convex, and are short. The present vegetation in most areas is mainly galleta, Mormon-tea, shadscale, mat saltbush, and annual weeds. The mat saltbush is on the Chipeta soil. Elevation is 5,200 to 5,900 feet. The average annual precipitation is about 8 to 9 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 50 percent Rock outcrop; 30 percent Chipeta silty clay, 15 to 30 percent slopes; and 20 percent Canyon family soils, 8 to 30 percent slopes.

Rock outcrop consists of barren or nearly barren areas of exposed bedrock. It occurs mainly as nearly vertical cliffs and ledges.

The Chipeta soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from shale. Typically, the surface layer is light yellowish brown silty clay about 2 inches thick. The underlying material to a depth of 12 inches is olive brown silty clay loam. Shale is at a depth of 12 inches. Depth to shale ranges from 8 to 20 inches.

Permeability of the Chipeta soil is slow to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 2 inches. Effective rooting depth is 8 to 20 inches. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

The Canyon family soils are shallow and well drained. They formed in residuum and colluvium derived dominantly from shale. No single profile is typical of these soils, but one commonly observed in the survey area has a bouldery surface. The surface layer is brown extremely bouldery clay loam about 5 inches thick. The underlying material to a depth of 18 inches is light yellowish brown clay loam. Shale is at a depth of 18 inches. Depth to shale ranges from 5 to 20 inches.

Permeability of the Canyon family soil is moderately slow to the restrictive layer. Available water capacity is about 2.0 to 3.5 inches. Water supplying capacity is 2 inches. Effective rooting depth is 5 to 20 inches. The organic matter content of the surface layer is about 0.5 to 2.0 percent. Runoff is rapid and the hazard of water erosion is high. The hazard of soil blowing is slight.

This unit is used mainly as wildlife habitat. A few areas are used as rangeland.

The potential plant community on the Chipeta soil is 20 percent grasses, 20 percent forbs, and 60 percent shrubs. Important plants are mat saltbush, Indian ricegrass, galleta, and deserttrumpet.

The potential plant community on the Canyon family soil is 50 percent grasses, 5 percent forbs, and 45 percent shrubs. Important plants are galleta, shadscale, Torrey Mormon-tea, and wedgeleaf saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are the shallow depth of the soil, low precipitation, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Chipeta soil is in the Desert Shallow Clay range site, and the Canyon family soils are in the Semidesert Shallow Clay (Shadscale) range site.

90—Rock outcrop-Farb complex. This map unit is on hillsides. Slopes are 4 to 30 percent, are concave to convex, and are short. The present vegetation in most areas is mainly Bigelow sagebrush, Mormon-tea, galleta, and shadscale. Elevation is 4,700 to 4,800 feet. The average annual precipitation is about 6 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 150 to 160 days.

This unit is 50 percent Rock outcrop; 35 percent Farb channery sandy loam, 4 to 30 percent slopes; and 15 percent other soils.

Included in this unit is about 15 percent Farb fine sandy loam.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

The Farb soil is very shallow and excessively drained. It formed in residuum derived dominantly from sandstone. Typically, the surface layer is light brown

channery sandy loam about 3 inches thick. The underlying material to a depth of 6 inches is brown channery sandy loam. Sandstone is at a depth of 6 inches. Depth to sandstone ranges from 5 to 10 inches.

Permeability of the Farb soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 to 1.0 inch. Water supplying capacity is 2 inches. Effective rooting depth is 5 to 10 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is slight.

This unit is used mainly as wildlife habitat. A few areas are used as rangeland.

The potential plant community on the Farb soil is 30 percent grasses, 15 percent forbs, and 55 percent shrubs. Important plants are desert needlegrass, Indian ricegrass, galleta, fourwing saltbush, shadscale, Mormon-tea, and blackbrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the very shallow depth of the soil, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Farb soil is in the Desert Very Shallow Sandy Loam range site. Rock outcrop is not placed in a range site.

91—Rock outcrop-Montosa family complex. This map unit is on mountainsides. Slopes are 30 to 50 percent, are concave to convex, and are short. The present vegetation in most areas is Utah juniper, pinyon, green Mormon-tea, and muttongrass. There are some coniferous trees and curlleaf mountainmahogany growing in the fractures of the Rock outcrop. Elevation is 7,000 to 10,000 feet; however, most areas are at an elevation of 7,000 to 8,000 feet. The average annual precipitation is about 13 to 16 inches, the average annual air temperature is 45 to 47 degrees F, and the freeze-free period is 75 to 100 days.

This unit is 50 percent Rock outcrop; 25 percent Montosa family soils, 30 to 50 percent slopes; and 25 percent other soils and Rubble land.

Included in this unit are about 10 percent Rubble land and 15 percent soils that are shallow over sandstone.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

The Montosa family soils are very deep and well drained. They formed in alluvium and colluvium derived dominantly from diorite and sandstone. No single profile of these soils is typical, but one commonly observed in the survey area has a surface layer of brown cobbly very fine sandy loam about 3 inches thick. The subsoil is brown very cobbly loam about 8 inches thick. The upper 41 inches of the substratum is brown very cobbly coarse sandy loam, and the lower part to a depth of 60 inches or more is pale brown extremely cobbly coarse sand. A layer of calcium carbonate accumulation is at a depth of 11 to 20 inches.

Permeability of the Montosa family soils is moderate. Available water capacity is about 3 to 5 inches. Water supplying capacity is 4 to 7 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 3 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is slight.

This unit is used mainly for wildlife habitat. It has very limited use as woodland and rangeland.

The potential plant community on the Montosa family soils is 60 percent grasses, 5 percent forbs, and 35 percent shrubs. Important understory plants are blue grama, Nevada bluegrass, green Mormon-tea, and rock goldenrod. The overstory is pinyon and Utah juniper.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Because of the steepness of slope, grazing should be carefully managed to prevent overgrazing, which could cause excessive soil erosion. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are steepness of slope and the areas of Rock outcrop; however, for emergency erosion control following a fire or for other special needs, seeding could be done by aerial methods.

This map unit is in capability subclass VIIe, nonirrigated. The Montosa family soils are in the Upland Stony Loam (Pinyon-Juniper) woodland site. Rock outcrop is not placed in a range site.

92—Rock outcrop-Stormitt-Rizno complex. This map unit is on stream terraces and benches. Slopes are 2 to 15 percent, are concave to convex, and are medium in length. The present vegetation in most areas is mainly blackbrush, annual forbs, galleta, and a small amount of Utah juniper. Elevation is 5,000 to 6,000 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 130 to 150 days.

This unit is 40 percent Rock outcrop; 30 percent Stormitt cobbly loam, warm, 2 to 15 percent slopes; 25 percent Rizno fine sandy loam, 4 to 15 percent slopes; and 5 percent Riverwash.

Included in this unit is about 5 percent Riverwash on the bottom of drainageways.

Rock outcrop consists of barren or nearly barren areas of exposed bedrock. It occurs mainly as nearly vertical cliffs and ledges.

The Stormitt soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone and diorite. Typically, the surface layer is reddish brown cobbly loam about 2 inches thick. The subsoil is reddish brown very cobbly clay loam about 9 inches thick. The substratum to a depth of 60 inches or more is pink very cobbly loam. A layer of calcium carbonate accumulation is at a depth of 11 to 20 inches.

Permeability of the Stormitt soil is moderate. Available water capacity is about 4.5 to 6.5 inches. Water supplying capacity is 5 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is slight.

The Rizno soil is shallow and well drained. It formed in residuum derived dominantly from sandstone. Typically, the surface layer is yellowish red fine sandy loam about 3 inches thick. The underlying material to a depth of 12 inches is yellowish red channery loam. Sandstone is at a depth of 12 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Rizno soil is moderately rapid to the restrictive layer. Available water capacity is about 1.0 inch to 1.5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Stormitt soil is 40 percent grasses, 10 percent forbs, and 50 percent shrubs. Important plants are blackbrush, Mormon-tea, galleta, and Indian ricegrass.

The potential plant community on the Rizno soil is 15 percent grasses, 25 percent forbs, and 60 percent shrubs. Important plants are blackbrush, Indian ricegrass, galleta, and Bigelow sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow depth of the Rizno soil.

This map unit is in capability subclass VIIs, nonirrigated. The Stormitt soil is in the Semidesert Stony Loam (Blackbrush) range site, and the Rizno soil is in the Semidesert Shallow Sandy Loam (Blackbrush) range site. Rock outcrop is not placed in a range site.

93—Rock outcrop-Travessilla complex. This map unit is on dissected hillsides, uplands, and benches. Slopes are 4 to 30 percent, are concave to convex, and are medium in length. The present vegetation in most areas is mainly Bigelow sagebrush, needleandthread, and littleleaf mountainmahogany. Pinyon and juniper are in some areas. Elevation is 5,200 to 5,300 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 52 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 55 percent Rock outcrop; 25 percent Travessilla channery sandy loam, very shallow, 4 to 30 percent slopes; and 20 percent other soils.

Included in this unit are about 10 percent Travessilla fine sandy loam, 5 percent Chipeta silty clay, and 5 percent Mido loamy fine sand, dry.

Rock outcrop consists of barren or nearly barren areas of exposed bedrock. It occurs mainly as nearly vertical cliffs and ledges.

The Travessilla soil is very shallow and well drained. It formed in residuum derived dominantly from sandstone. Typically, the surface layer is light brown channery sandy loam about 2 inches thick. The underlying material to a depth of 8 inches is light brown channery sandy loam. Sandstone is at a depth of 8 inches. Depth to sandstone ranges from 6 to 10 inches.

Permeability of the Travessilla soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 inch to 1.5 inches. Water supplying capacity is 2 inches. Effective rooting depth is 6 to 10 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is slight.

This unit is used mainly for wildlife habitat. It has very limited use as rangeland.

The potential plant community on the Travessilla soil is 30 percent grasses, 15 percent forbs, and 55 percent shrubs. Important plants are needleandthread, Bigelow sagebrush, shadscale, littleleaf mountainmahogany, and Utah juniper.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are the very shallow depth of the soil, low precipitation, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Travessilla soil is in the Semidesert

Shallow Sandy Loam range site. Rock outcrop is not placed in a range site.

94—Rock outcrop-Travessilla, warm complex. This map unit is on dissected benches and hillsides. Slopes are 4 to 30 percent, are concave to convex, and are medium in length. The present vegetation in most areas is mainly blackbrush, broom snakeweed, Mormon-tea, and galleta. Elevation is 5,500 to 5,600 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 65 percent Rock outcrop; 20 percent Travessilla channery sandy loam, warm, 4 to 30 percent slopes; and 15 percent other soils and Badland.

Included in this unit are about 10 percent soils that are similar to this Travessilla soil but have a fine sandy loam surface layer and 5 percent Badland.

Rock outcrop consists of barren or nearly barren areas of exposed bedrock. It occurs mainly as nearly vertical cliffs and ledges.

The Travessilla soil is very shallow and well drained. It formed in residuum derived dominantly from sandstone. Typically, the surface layer is light brown channery sandy loam about 2 inches thick. The underlying material to a depth of 9 inches is brown channery sandy loam. Sandstone is at a depth of 9 inches. Depth to sandstone ranges from 6 to 10 inches.

Permeability of the Travessilla soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 inch to 1.5 inches. Water supplying capacity is 2 inches. Effective rooting depth is 6 to 10 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used mainly as wildlife habitat. A few areas are used as rangeland.

The potential plant community on the Travessilla soil is 25 percent grasses, 10 percent forbs, and 65 percent shrubs. Important plants are blackbrush, Mormon-tea, and galleta.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are the very shallow depth of the soil, low precipitation, and areas of Rock outcrop.

This map unit is in capability subclass VIIIs. The Travessilla soil is in the Semidesert Very Shallow Sandy Loam (Blackbrush) range site. Rock outcrop is not placed in a range site.

95—Rogert-Rogert Variant complex. This map unit is on mountainsides. Slopes are 50 to 70 percent, are convex, and are short. The present vegetation in most areas is mainly fringed sagewort, black sagebrush, birchleaf mountainmahogany, bluegrass, and sheep fescue. Elevation is 9,500 to 11,500 feet. The average annual precipitation is about 20 to 30 inches, the average annual air temperature is 32 to 35 degrees F, and the freeze-free period is 0 to 20 days.

This unit is 50 percent Rogert very gravelly loam, 50 to 70 percent slopes; 25 percent Rogert Variant loam, 50 to 70 percent slopes; and 25 percent other soils, Rubble land, and Rock outcrop.

Included in this unit are about 10 percent Olnes family soils; 10 percent Pando family soils, and 5 percent Rubble land. Also included are small areas of Rock outcrop.

The Rogert soil is shallow and well drained. It formed in colluvium and residuum derived dominantly from diorite. Typically, the surface layer is dark grayish brown very gravelly loam about 9 inches thick. The underlying material to a depth of 18 inches is brown very gravelly loam. Fractured diorite is at a depth of 18 inches. Depth to diorite ranges from 10 to 20 inches.

Permeability of the Rogert soil is moderately rapid to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 7 to 10 inches. The organic matter content of the surface layer is about 3 to 6 percent. Runoff is medium, and the hazard of water erosion is moderate.

The Rogert Variant soil is shallow and well drained. It formed in colluvium and residuum derived dominantly from shale. Typically, the surface layer is brown loam about 8 inches thick. The underlying material to a depth of 19 inches is light grayish brown very shaly loam. Unweathered shale is at a depth of 19 inches. Depth to shale ranges from 10 to 20 inches.

Permeability of the Rogert Variant soil is moderate to the restrictive layer. Available water capacity is about 1.5 to 2.5 inches. Water supplying capacity is 7 to 10 inches. The organic matter content of the surface layer is about 3 to 6 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used as rangeland, wildlife habitat, and woodland.

The potential plant community on the Rogert soil is 50 percent grasses, 15 percent forbs, and 35 percent shrubs. Important plants are Salina wildrye, bluegrass, bluebunch wheatgrass, and black sagebrush.

The potential plant community on the Rogert Variant soil is 50 percent grasses, 15 percent forbs, and 35 percent shrubs. Important plants are Salina wildrye, bluebunch wheatgrass, bluegrass, and black sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance

of preferred species is maintained in the plant community. Because of the steepness of slope, grazing should be carefully managed to prevent overgrazing, which could cause excessive soil erosion. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are steepness of slope and the shallow depth of the soils; however, for emergency erosion control following a fire or for other special needs, seeding could be done by aerial methods.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Mountain Shallow Loam (Black Sagebrush) range site.

96—Rubble land. Rubble land consists of areas of stones and boulders that are virtually free of vegetation. The areas commonly are at the base of very steep slopes.

Included in this unit are small areas in which there is sufficient soil to produce some curlleaf mountainmahogany.

This map unit is in capability subclass VIIIs. Rubble land is not placed in a range site.

97—Shedado complex. This map unit is on alluvial fans and hillsides. Slopes are 4 to 15 percent, are convex, and are medium in length. The present vegetation in most areas is mainly fourwing saltbush, galleta, Indian ricegrass, sand dropseed, Mormon-tea, and Utah juniper. Elevation is 5,200 to 6,200 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 45 percent Shedado loamy fine sand, 4 to 15 percent slopes, severely eroded; 30 percent Shedado fine sandy loam, 4 to 15 percent slopes, severely eroded; and 25 percent other soils, Rock outcrop, and Badland.

Included in this unit are about 10 percent Chipeta Variant clay loam, 10 percent Rock outcrop, and 5 percent Badland.

The Shedado loamy fine sand is moderately deep and well drained. It formed in eolian deposits and alluvium derived dominantly from sandstone. Typically, the surface layer is light reddish brown loamy fine sand about 10 inches thick. The underlying material to a depth of 36 inches is light reddish brown fine sandy loam. Interbedded shale and sandstone are at a depth of 36 inches. Depth to shale and sandstone ranges from 20 to 40 inches.

Permeability of this Shedado soil is moderately rapid to the restrictive layer. Available water capacity is about 3 to 4 inches. Water supplying capacity is 3 to 4 inches. The organic matter content of the surface layer is about 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Shedado fine sandy loam is moderately deep and well drained. It formed in alluvial and eolian material derived dominantly from sandstone. Typically, the surface layer is light reddish brown fine sandy loam about 3 inches thick. The underlying material to a depth of 22 inches is light reddish brown fine sandy loam. Interbedded shale and sandstone are at a depth of 22 inches. Depth to shale and sandstone ranges from 20 to 30 inches.

Permeability of this Shedado soil is moderately rapid to the restrictive layer. Available water capacity is about 2.0 to 2.5 inches. Water supplying capacity is 3 to 4 inches. The organic matter content of the surface layer is about 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Shedado loamy fine sand is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are Indian ricegrass, needleandthread, winterfat, fourwing saltbush, and Mormon-tea.

The potential plant community on the Shedado fine sandy loam is 35 percent grasses, 20 percent forbs, and 45 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, Mormon-tea, needleandthread, and Bigelow sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIe, nonirrigated. The Shedado loamy fine sand is in the Semidesert Sandy Loam range site, and the Shedado fine sandy loam is in the Semidesert Shallow Sandy Loam range site.

98—Sheppard sand, 2 to 8 percent slopes. This very deep, somewhat excessively drained soil is on upland benches. It formed in eolian and alluvial deposits derived dominantly from sandstone. Slopes are concave to convex, have hummocks of sand, and are short. The present vegetation in most areas is mainly Indian ricegrass, sandhill muhly, broom snakeweed, Mormon-tea, wavyleaf oak, and dropseed. Elevation is 4,600 to 5,700 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the soil is reddish brown sand to a depth of 60 inches or more.

Included in this unit are small areas of Moffat loamy fine sand.

Permeability of the Sheppard soil is rapid. Available water capacity is about 3.5 to 4.5 inches. Water supplying capacity is 3.0 to 4.5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is very high.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 55 percent grasses, 20 percent forbs, and 25 percent shrubs. Important plants are Indian ricegrass, spike dropseed, sand dropseed, and fourwing saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are the sandy texture of the soils and low precipitation.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Desert Sand range site.

99—Sheppard loamy fine sand, 2 to 8 percent slopes. This very deep, somewhat excessively drained soil is on upland benches. It formed in eolian and alluvial deposits derived dominantly from sandstone. Slopes are concave to convex and are medium in length. The present vegetation in most areas is mainly Indian ricegrass, Mormon-tea, sandhill muhly, and sand sagebrush. Elevation is 4,000 to 5,200 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 53 degrees F, and the freeze-free period is 140 to 170 days.

Typically, the surface layer is light reddish brown loamy fine sand about 3 inches thick. The upper 37 inches of the underlying material is light reddish brown loamy fine sand, and the lower part to a depth of 60 inches or more is pink loamy fine sand that has common gypsum crystals.

Included in this unit are about 5 percent Moenkopie fine sandy loam and 5 percent Rock outcrop.

Permeability of the Sheppard soil is rapid. Available water capacity is about 4 to 5 inches. Water supplying capacity is 3.5 to 5.0 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 55 percent grasses, 20 percent forbs, and 25 percent shrubs. Important plants are Indian ricegrass, spike dropseed, sand dropseed, and fourwing saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are the sandy texture of the soil and low precipitation.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Desert Sand range site.

100—Sheppard-Goblin complex. This map unit is on dissected benches, fans, and pediment surfaces. Slopes are 2 to 30 percent, are concave to convex, and are short. The present vegetation in most areas is mainly shadscale, Mormon-tea, fourwing saltbush, Indian ricegrass, and sand sagebrush. Elevation is 4,300 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 60 percent Sheppard loamy fine sand, 2 to 8 percent slopes, eroded; 30 percent Goblin loam, 2 to 30 percent slopes, severely eroded; and 10 percent other soils and gypsum land.

Included in this unit are about 5 percent Robroost fine sandy loam and 5 percent gypsum land.

The Sheppard soil is very deep and somewhat excessively drained. It formed in eolian and alluvial material derived dominantly from sandstone. Typically, the surface layer is yellowish red loamy fine sand about 3 inches thick. The upper 37 inches of the underlying material is yellowish red loamy fine sand, and the lower part to a depth of 60 inches or more is yellowish red loamy fine sand that has visible masses of gypsum.

Permeability of the Sheppard soil is rapid. Available water capacity is about 4 to 5 inches. Water supplying capacity is 3.5 to 5.0 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Goblin soil is very shallow and well drained. It formed in residuum derived dominantly from gypsiferous shale and sandstone. Typically, the surface layer is strong brown loam about 5 inches thick. Gypsiferous shale and sandstone are at a depth of 5 inches. Depth to shale and sandstone ranges from 5 to 10 inches.

Permeability of the Goblin soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 to 1.0 inch. Water supplying capacity is 2 inches. Effective rooting depth is 4 to 10 inches. The organic

matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Sheppard soil is 55 percent grasses, 20 percent forbs, and 25 percent shrubs. Important plants are Indian ricegrass, spike dropseed, sand dropseed, and fourwing saltbush.

The potential plant community on the Goblin soil is 25 percent grasses, 15 percent forbs, and 60 percent shrubs. Important plants are galleta, Indian ricegrass, Torrey Mormon-tea, club eriogonum, and shadscale.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the sandy texture of the Sheppard soil, and the very shallow depth of the Goblin soil.

This map unit is in capability subclass VIIs, nonirrigated. The Sheppard soil is in the Desert Sand range site, and the Goblin soil is in the Desert Very Shallow Gypsum range site.

101—Sheppard-Leebench complex. This map unit is on alluvial fans. Slopes are 2 to 8 percent and are medium in length. The present vegetation in most areas is mainly Indian ricegrass, galleta, Mormon-tea, desert Indianwheat, and shadscale. Elevation is 4,400 to 4,800 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 60 percent Sheppard loamy fine sand, 2 to 8 percent slopes, eroded; 30 percent Leebench fine sandy loam, 2 to 8 percent slopes; and 10 percent other soils.

Included in this unit are about 5 percent Chipeta silty clay and 5 percent Moenkopie fine sandy loam.

The Sheppard soil is very deep and somewhat excessively drained. It formed in eolian and alluvial deposits derived dominantly from sandstone. Typically, the surface layer is light reddish brown loamy fine sand about 3 inches thick. The underlying material to a depth of 60 inches or more is light reddish brown loamy fine sand.

Permeability of the Sheppard soil is rapid. Available water capacity is about 4 to 5 inches. Water supplying capacity is 3 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Leebench soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone and shale. Typically, the surface layer is light brown fine sandy loam about 2 inches thick. The subsoil is light brown, very strongly alkaline clay loam about 9 inches thick. The underlying material to a depth of 60 inches or more is light brown, very strongly alkaline extremely gravelly sandy loam. This soil is affected by sodium throughout most of the profile. A layer of calcium carbonate accumulation is at a depth of 11 to 20 inches.

Permeability of the Leebench soil is slow. Available water capacity is about 5 to 8 inches. Water supplying capacity is 3.5 to 4.5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Sheppard soil is 55 percent grasses, 20 percent forbs, and 25 percent shrubs. Important plants are Indian ricegrass, spike dropseed, sand dropseed, and fourwing saltbush.

The potential plant community on the Leebench soil is 25 percent grasses, 25 percent forbs, and 50 percent shrubs. Important plants are galleta, Indian ricegrass, deserttrumpet, wedgeleaf saltbush, and bud sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the sandy texture of the Sheppard soil, and the alkali condition of the Leebench soil.

This map unit is in capability subclass VIIs, nonirrigated. The Sheppard soil is in the Desert Sand range site, and the Leebench soil is in the Alkali Fan range site.

102—Sheppard-Moenkopie complex. This map unit is on upland benches. Slopes are 2 to 30 percent, are concave to convex, and are short. The present vegetation in most areas is mainly sand sagebrush, galleta, Indian ricegrass, and annuals. Elevation is 4,850 to 4,950 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 65 percent Sheppard loamy fine sand, 2 to 8 percent slopes, eroded; 20 percent Moenkopie

channery sandy loam, 4 to 30 percent slopes, eroded; and 15 percent other soils and Rock outcrop.

Included in this unit are about 5 percent Leebench fine sandy loam; 5 percent Hanksville clay loam; and 5 percent Rock outcrop.

The Sheppard soil is very deep and somewhat excessively drained. It formed in eolian and alluvial deposits derived dominantly from sandstone. Typically, the surface layer is light reddish brown loamy fine sand about 2 inches thick. The underlying material to a depth of 60 inches or more is reddish brown loamy fine sand.

Permeability of the Sheppard soil is rapid. Available water capacity is about 4 to 5 inches. Water supplying capacity is 3.5 to 5.0 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Moenkopie soil is very shallow and well drained. It formed in residuum and alluvium derived dominantly from sandstone. Typically, the surface layer is reddish brown channery sandy loam about 2 inches thick. The underlying material to a depth of 10 inches is light reddish brown sandy loam. Sandstone is at a depth of 10 inches. Depth to sandstone ranges from 4 to 10 inches.

Permeability of the Moenkopie soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 to 1.5 inch. Water supplying capacity is 2 inches. Effective rooting depth is 3 to 10 inches. The organic matter content of the surface layer is about 0.25 to 1.00 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Sheppard soil is 55 percent grasses, 20 percent forbs, and 25 percent shrubs. Important plants are Indian ricegrass, spike dropseed, sand dropseed, and fourwing saltbush.

The potential plant community on the Moenkopie soil is 30 percent grasses, 15 percent forbs, and 55 percent shrubs. Important plants are Indian ricegrass, desert needlegrass, galleta, Bigelow sagebrush, shadscale, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIs, nonirrigated. The Sheppard soil is in the Desert Sand range site, and the Moenkopie soil is in the Desert Very Shallow Sandy Loam range site.

103—Sheppard-Moenkopie, warm complex. This map unit is on upland benches. Slopes are 2 to 8 percent, are concave to convex, and are short. The present vegetation in most areas is mainly blackbrush, sand sagebrush, wavyleaf oak, fourwing saltbush, galleta, Indian ricegrass, and sand dropseed. Elevation is 4,500 to 5,000 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 40 percent Sheppard sand, hummocky, 2 to 8 percent slopes; 30 percent Moenkopie fine sandy loam, warm, 4 to 8 percent slopes, severely eroded; and 30 percent other soils and Rock outcrop.

Included in this unit are about 15 percent Pennell fine sandy loam and 15 percent Rock outcrop.

The Sheppard soil is very deep and somewhat excessively drained. It formed in eolian deposits and alluvium derived dominantly from sandstone. Typically, the soil is reddish brown sand to a depth of 60 inches or more.

Permeability of the Sheppard soil is rapid. Available water capacity is about 3.0 to 4.5 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is very high.

The Moenkopie soil is very shallow and well drained. It formed in residuum derived dominantly from sandstone and siltstone. Typically, the surface layer is reddish brown fine sandy loam about 1 inch thick. The upper 5 inches of the underlying material is reddish brown fine sandy loam, and the lower part to a depth of 9 inches is pink fine sandy loam. Sandstone is at a depth of 9 inches. Depth to sandstone ranges from 5 to 10 inches.

Permeability of the Moenkopie soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 inch to 1.5 inches. Water supplying capacity is 2 inches. Effective rooting depth is 5 to 10 inches. The organic matter content of the surface layer is about 0.25 to 1.00 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Sheppard soil is 55 percent grasses, 20 percent forbs, and 25 percent shrubs. Important plants are Indian ricegrass, spike dropseed, sand dropseed, and fourwing saltbush.

The potential plant community on the Moenkopie soil is 15 percent grasses, 10 percent forbs, and 75 percent shrubs. Important plants are blackbrush, Mormon-tea, shadscale, galleta, and Indian ricegrass.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance

of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the sandy texture of the Sheppard soil, and the very shallow depth of the Moenkopie soil.

This map unit is in capability subclass VIIs, nonirrigated. The Sheppard soil is in the Desert Sand range site, and the Moenkopie soil is in the Desert Very Shallow Sandy Loam (Blackbrush) range site.

104—Sheppard-Pennell-Rock outcrop complex. This map unit is on benches and hillsides. Slopes are 2 to 15 percent, are convex, and are long. The present vegetation in most areas is mainly Mormon-tea, blackbrush, and Indian ricegrass. Elevation is 4,600 to 4,800 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 30 percent Sheppard loamy fine sand, 8 to 15 percent slopes, eroded; 25 percent Pennell fine sandy loam, 2 to 8 percent slopes, eroded; 20 percent Rock outcrop; and 25 percent other soils.

Included in this unit is about 20 percent soils that are similar to the Pennell soil but are channery fine sandy loam to a depth of about 6 inches and are underlain by sandstone. Also included is 5 percent Neskahi family soils in drainageways.

The Sheppard soil is very deep and somewhat excessively drained. It formed in eolian deposits and alluvium derived dominantly from sandstone. Typically, the surface layer is reddish yellow loamy fine sand about 3 inches thick. The underlying material to a depth of 60 inches or more is strong brown fine sand.

Permeability of the Sheppard soil is rapid. Available water capacity is about 4 to 5 inches. Water supplying capacity is 3.5 to 5.0 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Pennell soil is shallow and well drained. It formed in residuum and alluvium derived dominantly from sandstone. Typically, the surface layer is strong brown fine sandy loam about 3 inches thick. The upper 6 inches of the underlying material is strong brown sandy loam, and the lower part to a depth of 16 inches is reddish yellow sandy loam. Sandstone is at a depth of 16 inches. A layer of calcium carbonate accumulation is at a depth of 4 to 9 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Pennell soil is moderate to the restrictive layer. Available water capacity is 1.5 to 3.5 inches. Water supplying capacity is 2 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Sheppard soil is 55 percent grasses, 20 percent forbs, and 25 percent shrubs. Important plants are Indian ricegrass, spike dropseed, sand dropseed, and fourwing saltbush.

The potential plant community on the Pennell soil is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, Mormon-tea, and blackbrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the sandy texture of the Sheppard soil, and the shallow depth of the Pennell soil.

This map unit is in capability subclass VIIs, nonirrigated. The Sheppard soil is in the Desert Sand range site, and the Pennell soil is in the Desert Shallow Sandy Loam range site. Rock outcrop is not placed in a range site.

105—Sheppard-Rock outcrop complex. This map unit is on uplands and alluvial fans. Slopes are 2 to 8 percent, are concave to convex, and are medium in length. The present vegetation in most areas is mainly sand sagebrush, Mormon-tea, and Indian ricegrass. Elevation is 4,600 to 4,800 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 60 percent Sheppard loamy fine sand, 2 to 8 percent slopes, eroded; 35 percent Rock outcrop; and 5 percent other soils.

Included in this unit is about 5 percent Moenkopie fine sandy loam.

The Sheppard soil is very deep and somewhat excessively drained. It formed in eolian and alluvial deposits derived dominantly from sandstone. Typically, the surface layer is light reddish brown loamy fine sand about 4 inches thick. The upper 26 inches of the underlying material is light reddish brown loamy fine sand, and the lower part to a depth of 60 inches or more is light reddish brown loamy fine sand that has common fine gypsum crystals and veins.

Permeability of the Sheppard soil is rapid. Available water capacity is about 3.5 to 5.0 inches. Water supplying capacity is 3 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

Rock outcrop consists of barren or nearly barren areas of bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Sheppard soil is 55 percent grasses, 15 percent forbs, and 25 percent shrubs. Important plants are Indian ricegrass, spike dropseed, sand dropseed, and fourwing saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the areas of Rock outcrop, and the sandy texture of the soil.

This map unit is in capability subclass VIIs, nonirrigated. The Sheppard soil is in the Desert Sand range site. Rock outcrop is not placed in a range site.

106—Stormitt gravelly loam, 2 to 15 percent slopes. This very deep, well drained soil is on alluvial fans and benches. It formed in alluvium derived dominantly from diorite and sandstone. Slopes are concave to convex and are medium in length. The present vegetation in most areas is mainly blackbrush, snakeweed, shadscale, galleta, and Indian ricegrass. Elevation is 5,000 to 6,000 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is reddish brown gravelly loam about 3 inches thick. The subsoil is reddish brown very cobbly clay loam about 9 inches thick. The upper 6 inches of the substratum is light reddish brown very cobbly loam, and the lower part to a depth of 60 inches or more is pinkish white very cobbly loam. A layer of calcium carbonate accumulation is at a depth of 12 to 20 inches.

Included in this unit are about 5 percent Rock outcrop and 5 percent Travessilla channery sandy loam.

Permeability of the Stormitt soil is moderate. Available water capacity is about 4.5 to 6.5 inches. Water supplying capacity is 3 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 40 percent grasses, 10 percent forbs, and 50 percent shrubs. Important plants are blackbrush, Mormon-tea, galleta, and Indian ricegrass.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Semidesert Stony Loam (Blackbrush) range site.

107—Stormitt extremely bouldery loam, 4 to 30 percent slopes. This very deep, well drained soil is on hillsides and fan terraces. It formed in alluvium derived dominantly from igneous and sedimentary rocks. Slopes are convex and are medium in length. The present vegetation in most areas is mainly rabbitbrush, Mormon-tea, blackbrush, broom snakeweed, galleta, goosefoot, and mallow. Elevation is 4,800 to 5,800 feet. The average annual precipitation is about 8 to 12 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is reddish brown extremely bouldery loam about 3 inches thick. The subsoil is reddish brown very cobbly clay loam about 9 inches thick. The upper 6 inches of the substratum is light reddish brown very cobbly loam, and the lower part to a depth of 60 inches or more is pinkish white very cobbly loam. A layer of calcium carbonate accumulation is at a depth of 5 to 20 inches.

Included in this unit are about 10 percent Stormitt gravelly loam, 5 percent Otero family soils, and 5 percent Rock outcrop.

Permeability of the Stormitt soil is moderate. Available water capacity is about 4.5 to 6.5 inches. Water supplying capacity is 3 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is medium, and the hazard of water erosion is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 50 percent grasses, 10 percent forbs, and 40 percent shrubs. Important plants are galleta, bush muhly, blue grama, Indian ricegrass, desert needlegrass, black grama, blackbrush, spiny hopsage, fourwing saltbush, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance

of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the extremely bouldery surface layer.

This map unit is in capability subclass VIIs, nonirrigated. It is in the Semidesert Bouldery Fan range site.

108—Stormitt-Rizno complex. This map unit is on alluvial fans and hillsides. Slopes are are 15 to 30 percent, convex, and are medium in length. The present vegetation in most areas is mainly blackbrush, broom snakeweed, Mormon-tea, galleta, and cheatgrass. Elevation is 5,000 to 5,600 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 130 to 150 days.

This unit is 60 percent Stormitt gravelly loam, 15 to 30 percent slopes; 20 percent Rizno fine sandy loam, 15 to 30 percent slopes; and 20 percent other soils and Rock outcrop.

Included in this unit are about 5 percent Mido loamy fine sand, dry; 5 percent Begay fine sandy loam; 5 percent Rock outcrop; and 5 percent Glenberg family soils in drainageways.

The Stormitt soil is very deep and well drained. It formed in alluvium derived dominantly from diorite and sandstone. Typically, the surface layer is light reddish brown gravelly loam about 2 inches thick. The subsoil is yellowish red gravelly loam about 5 inches thick. The upper 9 inches of the substratum is light brown very cobbly clay loam, and the lower part to a depth of 60 inches or more is light reddish brown very cobbly loam. A layer of calcium carbonate accumulation is at a depth of 7 to 20 inches.

Permeability of the Stormitt soil is moderate. Available water capacity is about 5.0 to 6.5 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is slight.

The Rizno soil is shallow and well drained. It formed in residuum and alluvium derived dominantly from sandstone. Typically, the surface layer is yellowish red fine sandy loam about 3 inches thick. The underlying material to a depth of 12 inches is yellowish red gravelly fine sandy loam. Sandstone is at a depth of 12 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Rizno soil is moderately rapid to the restrictive layer. Available water capacity is about 1.0 inch to 1.5 inches. Water supplying capacity is 2 to 4 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Stormitt soil is 40 percent grasses, 10 percent forbs, and 50 percent shrubs. Important plants are blackbrush, Mormon-tea, galleta, and Indian ricegrass.

The potential plant community on the Rizno soil is 15 percent grasses, 25 percent forbs, and 60 percent shrubs. Important plants are blackbrush, Indian ricegrass, galleta, and Bigelow sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow depth of the Rizno soil.

This map unit is in capability subclass VIIe, nonirrigated. The Stormitt soil is in the Semidesert Stony Loam (Blackbrush) range site, and the Rizno soil is in the Semidesert Shallow Sandy Loam (Blackbrush) range site.

109—Strych gravelly fine sandy loam, 2 to 15 percent slopes. This very deep, well drained soil is on dissected alluvial fans and fan terraces. It formed in alluvium derived dominantly from sandstone and shale. Slopes are concave to convex and are short. The present vegetation in most areas is mainly shadscale, galleta, Indian ricegrass, and snakeweed. Elevation is 5,000 to 6,000 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is brown gravelly fine sandy loam about 10 inches thick. The underlying material to a depth of 60 inches or more is light brown very cobbly sandy loam. A layer of calcium carbonate accumulation is at a depth of 10 to 15 inches.

Included in this unit is about 20 percent Strych soils that have a very cobbly fine sandy loam surface layer. Also included are small areas of Chipeta silty clay and Badland.

Permeability of the Strych soil is moderately rapid. Available water capacity is about 4.0 to 7.5 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are galleta, Indian ricegrass, shadscale, and fourwing saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the droughtiness of the soil.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Semidesert Stony Loam range site.

110—Tolman-Rock outcrop complex. This map unit is on uplands and mountainsides. Slopes are 30 to 50 percent, are convex, and are short. The present vegetation in most areas is mainly pinyon, Utah juniper, big sagebrush, Mormon-tea, and Utah serviceberry. Elevation is 7,000 to 8,000 feet. The average annual precipitation is about 14 to 16 inches, the average annual air temperature is 40 to 44 degrees F, and the freeze-free period is 75 to 100 days.

This unit is 40 percent Tolman very cobbly fine sandy loam, 30 to 50 percent slopes; 30 percent Rock outcrop; and 30 percent other soils.

Included in this unit are about 15 percent Delson cobbly loam and 15 percent Circleville cobbly loam.

The Tolman soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from sandstone and shale. Typically, the surface layer is brown very cobbly fine sandy loam about 9 inches thick. The subsoil is light brown very cobbly loam about 8 inches thick. Sandstone is at a depth of 17 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Tolman soil is moderate to the restrictive layer. Available water capacity is about 1 inch to 1.5 inches. Water supplying capacity is 3 to 5 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 2 to 3 percent. Runoff is medium, and the hazard of water erosion is moderate.

Rock outcrop consists of barren or nearly barren areas of exposed bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as woodland, rangeland, and wildlife habitat.

The potential plant community on the Tolman soil is 50 percent grasses, 10 percent forbs, and 40 percent shrubs. Important understory plants are galleta, bluegrass, Indian ricegrass, Mexican cliffrose, and Bigelow sagebrush. The overstory is pinyon and Utah juniper.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Because of the steepness of slope, grazing should be carefully managed to prevent overgrazing, which could cause excessive soil erosion. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are steepness of slope, the shallow depth of the soil, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Tolman soil is in the Upland Shallow Loam (Pinyon-Juniper) woodland site. Rock outcrop is not placed in a range site.

111—Trachute loamy fine sand, 2 to 8 percent slopes. This very deep, well drained soil is on alluvial fans and in valleys. It formed in alluvium derived dominantly from sandstone and some shale. Slopes are linear and long. The present vegetation in most areas is mainly Mormon-tea, shadscale, galleta, and Indian ricegrass. Elevation is 4,300 to 4,800 feet. The average annual precipitation is about 5 to 6 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is reddish brown loamy fine sand about 3 inches thick. The substratum to a depth of 60 inches or more is light reddish brown fine sandy loam that has some gypsum veins and crystals. Where this soil is irrigated, the surface layer is silty.

Included in this unit are about 10 percent Robroost fine sandy loam and 5 percent Neskahi family soils in some drainageways.

Permeability of the Trachute soil is moderately rapid. Available water capacity is about 5.5 to 8.5 inches. Water supplying capacity is 3 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used mainly as rangeland and wildlife habitat. It is also used as irrigated cropland.

The potential plant community is 50 percent grasses, 15 percent forbs, and 35 percent shrubs. Important plants are galleta, Indian ricegrass, dropseed, globemallow, winterfat, Mormon-tea, and fourwing saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance

of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

The main crops grown are alfalfa, alfalfa-grass, small grain, and corn for silage. A suitable crop rotation consists of alfalfa or alfalfa-grass, corn for silage, and small grain. The grain and corn should not be grown more than 30 percent of the rotation time. Fall plowing and minimum tillage are needed. Use of crop residue and commercial fertilizer maintains good soil tilth and fertility. Fertility levels can be checked by the use of soil fertility tests. Weed control by mechanical or chemical means is essential to maintain good production and a favorable plant community. Furrow, border corrugation, and sprinkler irrigation systems are suited to this unit. Water should be applied in amounts sufficient to wet the root zone but in amounts small enough to minimize the leaching of plant nutrients. Grazing when the soil is moist results in compaction of the surface layer, poor tilth, and excessive runoff.

Where irrigated, the soil in this unit will yield about 6 tons of alfalfa, 100 bushels of barley, 80 bushels of wheat, or 2 tons of corn silage per acre.

This map unit is in capability unit IIIs-15, irrigated, and capability subclass VIIe, nonirrigated. It is in the Desert Sandy Loam range site. The soil in this unit, where irrigated, is prime farmland.

112—Trachute-Goblin complex. This map unit is on alluvial fans and benches. Slopes are 2 to 30 percent, are convex, and are medium in length. The present vegetation in most areas is mainly shadscale, Mormon-tea, and fourwing saltbush. Elevation is 4,300 to 4,500 feet. The average annual precipitation is about 5 to 6 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 70 percent Trachute loamy fine sand, 2 to 8 percent slopes, severely eroded; 20 percent Goblin loam, 2 to 30 percent slopes, severely eroded; and 10 percent Badland and Rock outcrop.

Included in this unit are about 5 percent Badland and 5 percent Rock outcrop.

The Trachute soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone. Typically, the surface layer is yellowish red loamy fine sand about 4 inches thick. The upper 14 inches of the underlying material is light reddish brown fine sandy loam, and the lower part to a depth of 60 inches or more is strong brown sandy loam with a few flakes and veins of gypsum.

Permeability of the Trachute soil is moderately rapid. Available water capacity is about 5.5 to 8.5 inches. Water supplying capacity is 3 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Goblin soil is very shallow and shallow and is well drained. It formed in residuum derived dominantly from gypsiferous shale and sandstone. Typically, the soil is strong brown loam about 7 inches thick. Gypsiferous shale is at a depth of 7 inches. Depth to shale ranges from 4 to 20 inches. In some areas the surface layer is loamy fine sand.

Permeability of the Goblin soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 inch to 1.5 inches. Water supplying capacity is 2 inches. Effective rooting depth is 4 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Trachute soil is 50 percent grasses, 15 percent forbs, and 35 percent shrubs. Important plants are galleta, Indian ricegrass, dropseed, globemallow, winterfat, Mormon-tea, and fourwing saltbush.

The potential plant community on the Goblin soil is 25 percent grasses, 15 percent forbs, and 60 percent shrubs. Important plants are galleta, Indian ricegrass, Torrey Mormon-tea, club eriogonum, and shadscale.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow and very shallow depth of the Goblin soil.

This map unit is in capability subclass VIIe, nonirrigated. The Trachute soil is in the Desert Sandy Loam range site, and the Goblin soil is in the Desert Very Shallow Gypsum range site.

113—Trachute-Sheppard complex. This map unit is on benches and in valleys. Slopes are 2 to 8 percent, are concave to convex, and are medium in length. The present vegetation in most areas is mainly galleta, dropseed, wavyleaf oak, Indian ricegrass, and sand sagebrush. Elevation is 4,800 to 5,200 feet. The average annual precipitation is about 5 to 8 inches, the average annual air temperature is 50 to 52 degrees F, and the freeze-free period is 140 to 160 days.

This unit is 45 percent Trachute loamy fine sand, 2 to 8 percent slopes, severely eroded; 40 percent Sheppard sand, hummocky, 2 to 8 percent slopes; and 15 percent other soils and Rock outcrop.

Included in this unit are about 10 percent Moenkopie fine sandy loam and 5 percent Rock outcrop.

The Trachute soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone. Typically, the surface layer is reddish brown loamy fine sand about 3 inches thick. The underlying material to a depth of 60 inches or more is light reddish brown fine sandy loam that has few gypsum veins and crystals.

Permeability of the Trachute soil is moderately rapid. Available water capacity is about 5.5 to 8.5 inches. Water supplying capacity is 3 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Sheppard soil is very deep and somewhat excessively drained. It formed in eolian and alluvial deposits derived dominantly from sandstone. Typically, the soil is reddish brown sand to a depth of 60 inches or more.

Permeability of the Sheppard soil is rapid. Available water capacity is about 3.0 to 4.5 inches. Water supplying capacity is 3 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is very high.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Trachute soil is 50 percent grasses, 15 percent forbs, and 35 percent shrubs. Important plants are galleta, Indian ricegrass, dropseed, globemallow, winterfat, Mormon-tea, and fourwing saltbush.

The potential plant community on the Sheppard soil is 55 percent grasses, 20 percent forbs, and 25 percent shrubs. Important plants are Indian ricegrass, spike dropseed, sand dropseed, and fourwing saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the sandy texture of the Sheppard soil.

This map unit is in capability subclass VIIs, nonirrigated. The Trachute soil is in the Desert Sandy Loam range site, and the Sheppard soil is in the Desert Sand range site.

114—Trail loam. This very deep, well drained soil is on alluvial fans. It is between Cainville and Blue Valley, along the Fremont River. It formed in alluvium derived dominantly from mixed sedimentary rocks. Slopes are 1 to 2 percent. They are linear and long. The present vegetation in most areas is mainly rabbitbrush, Indian ricegrass, galleta, and Russian-thistle. Elevation is 4,400 to 4,800 feet. The average annual precipitation is about 5 to 7 inches, the average annual air temperature is 51 to 52 degrees F, and the freeze-free period is 140 to 160 days.

Typically, the surface layer is reddish brown, loam about 10 inches thick. The upper 6 inches of the underlying material is light reddish brown, sandy loam, and the lower part to a depth of 60 inches or more is light reddish brown, stratified loamy fine sand to sand.

Included in this unit is about 15 percent soils that are similar to this Trail soil but have a silty clay loam surface layer.

Permeability of the Trail soil is rapid. Available water capacity is about 4 to 8 inches. Water supplying capacity is 3 to 4 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used mainly as irrigated cropland. It is also used as rangeland and wildlife habitat.

The potential plant community is 50 percent grasses, 15 percent forbs, and 35 percent shrubs. Important plants are galleta, sand dropseed, Indian ricegrass, spike dropseed, fourwing saltbush, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

The main crops grown are alfalfa, alfalfa-grass, small grain, and corn for silage. A suitable crop rotation consists of alfalfa or alfalfa-grass, corn for silage, and small grain. The grain and corn should not be grown more than 30 percent of the rotation time. Use of crop residue and commercial fertilizer maintains good soil tilth and fertility. Fertility levels can be checked by the use of soil fertility tests. Weed control by mechanical or chemical means is essential to maintain good production and a favorable plant community.

In some areas the supply of irrigation water is inadequate after midseason. Furrow, border, corrugation, and sprinkler irrigation systems are suited to this unit; however, sprinkler irrigation is the most suitable method. Use of this method permits the even, controlled application of water, reduces runoff, and minimizes the risk of erosion. Water should be applied in amounts sufficient to wet the root zone but in amounts small enough to minimize the leaching of plant nutrients. If

furrow irrigation is used, water should be applied at frequent intervals and runs should be short. Grazing when the soil is moist results in compaction of the surface layer, poor tilth, and excessive runoff.

If irrigated, this unit can produce about 5 tons of alfalfa hay per acre.

This map unit is in capability unit IIs-16, irrigated, and capability subclass VIIs, nonirrigated. It is in the Desert Sand range site. The soil in this unit, where irrigated, is prime farmland.

115—Travessilla-Badland-Rock outcrop complex. This map unit is on dissected benches and hillsides. Slopes are 4 to 30 percent, are concave to convex, and are short. The present vegetation in most areas is mainly Mormon-tea, galleta, Indian ricegrass, and littleleaf mountainmahogany. Elevation is 5,200 to 5,300 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 130 days.

This unit is 70 percent Travessilla channery sandy loam, 4 to 30 percent slopes; 15 percent Badland; 10 percent Rock outcrop; and 5 percent other soils.

Included in this unit is about 5 percent Travessilla fine sandy loam in concave areas.

The Travessilla soil is very shallow and well drained. It formed in residuum derived dominantly from sandstone. Typically, the surface layer is light brown channery sandy loam about 3 inches thick. The underlying material to a depth of 7 inches is light brown channery sandy loam. Sandstone is at a depth of 7 inches. Depth to sandstone ranges from 6 to 10 inches.

Permeability of the Travessilla soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 to 1.0 inch. Water supplying capacity is 2 inches. Effective rooting depth is 6 to 10 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is slight.

Badland is steep and very steep, barren areas of shale that are dissected by many intermittent drainageways. Badland is in an arid or semiarid climate. Potential runoff is very rapid, and the hazard of erosion is very high.

Rock outcrop consists of barren or nearly barren areas of exposed bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used mainly as wildlife habitat. Some areas are used as rangeland.

The potential plant community on the Travessilla soil is 30 percent grasses, 15 percent forbs, and 55 percent shrubs. Important plants are needleandthread, Bigelow sagebrush, shadscale, littleleaf mountainmahogany, and Utah juniper.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are the very shallow depth of the soil, low precipitation, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Travessilla soil is in the Semidesert Shallow Sandy Loam range site. Badland and Rock outcrop are not placed in a range site.

116—Travessilla-Rock outcrop complex. This map unit is on dissected uplands and mesas. Slopes are 4 to 15 percent, are concave to convex, and are short. The present vegetation in most areas is mainly fourwing saltbush, galleta, Indian ricegrass, and shadscale. Elevation is 5,000 to 6,400 feet. The average annual precipitation is about 8 to 12 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 40 percent Travessilla fine sandy loam, 4 to 15 percent slopes; 35 percent Rock outcrop; and 25 percent other soils and Badland.

Included in this unit are about 15 percent Bowdish Variant fine sandy loam, 5 percent Chipeta silty clay, and 5 percent Badland.

The Travessilla soil is shallow and well drained. It formed in residual and eolian material derived dominantly from sandstone. Typically, the surface layer is light yellowish brown fine sandy loam about 6 inches thick. The underlying material to a depth of 12 inches is pale brown fine sandy loam. Sandstone is at a depth of 12 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Travessilla soil is moderately rapid to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 2 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

Rock outcrop consists of barren or nearly barren areas of exposed bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as wildlife habitat. Some areas are used as rangeland.

The potential plant community on the Travessilla soil is 35 percent grasses, 20 percent forbs, and 45 percent shrubs. Important plants are galleta, Indian ricegrass, Mormon-tea, Bigelow sagebrush, shadscale, and fourwing saltbush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant

community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are the shallow depth of the soil, low precipitation, and the areas of Rock outcrop.

This map unit is in capability subclass VIIs, nonirrigated. The Travessilla soil is in the Semidesert Shallow Sandy Loam range site. Rock outcrop is not placed in a range site.

117—Wayneco-Mido complex. This map unit is on mesas and benches. Slopes are 4 to 15 percent, are concave to convex, and are short. The present vegetation in most areas is mainly blackbrush, Mormon-tea, galleta, and sandhill muhly. The blackbrush grows mostly on the Wayneco soils. Elevation is 5,000 to 5,800 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 48 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 40 percent Wayneco fine sand, 4 to 8 percent slopes, severely eroded; 40 percent Mido loamy fine sand, hummocky, 4 to 15 percent slopes; and 20 percent other soils and Rock outcrop.

Included in this unit are about 15 percent Windwhistle loamy very fine sand and 5 percent Rock outcrop.

The Wayneco soil is shallow and well drained. It formed in colluvium and residuum derived dominantly from sandstone. Typically, the surface layer is yellowish red fine sand about 3 inches thick. The subsoil is yellowish red loamy fine sand about 6 inches thick. The substratum to a depth of 19 inches is reddish yellow fine sandy loam. Sandstone is at a depth of 19 inches. A layer of carbonate accumulation is at a depth 4 to 9 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Wayneco soil is moderate to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is very high.

The Mido soil is very deep and excessively drained. It formed in eolian deposits derived dominantly from sandstone. Typically, the profile is yellowish red loamy fine sand to a depth of 60 inches or more.

Permeability of the Mido soil is rapid. Available water capacity is about 3.5 to 6.0 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Wayneco soil is 15 percent grasses, 25 percent forbs, and 60 percent shrubs. Important plants are blackbrush, Indian ricegrass, galleta, and Bigelow sagebrush.

The potential plant community on the Mido soil is 50 percent grasses, 20 percent forbs, and 30 percent shrubs. Important plants are galleta, Indian ricegrass, dropseed, needleandthread, fourwing saltbush, Mormon-tea, and sand sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation, the shallow depth of the Wayneco soil, and the sandy texture of the Mido soil.

This map unit is in capability subclass VIIs, nonirrigated. The Wayneco soil is in the Semidesert Shallow Sandy Loam (Blackbrush) range site, and the Mido soil is in the Semidesert Sand range site.

118—Wayneco-Milok-Rock outcrop complex. This map unit is on mesas, benches, ridges, and hillsides. Slopes are 2 to 30 percent and are convex. The present vegetation in most areas is mainly blackbrush, Mormon-tea, rabbitbrush, and juniper. Elevation is 5,200 to 5,500 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 48 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 40 percent Wayneco fine sandy loam, 2 to 30 percent slopes; 30 percent Milok loamy fine sand, 4 to 8 percent slopes; 20 percent Rock outcrop; and 10 percent other soils.

Included in this unit are about 10 percent soils that are similar to the Wayneco soil but are less than 10 inches deep over sandstone.

The Wayneco soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from sandstone. Typically, the surface layer is reddish brown fine sandy loam about 2 inches thick. The subsoil is reddish brown fine sandy loam about 6 inches thick. The substratum to a depth of 16 inches is light reddish brown fine sandy loam. Sandstone is at a depth of 16 inches. A layer of calcium carbonate accumulation is at a depth of 4 to 9 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Wayneco soil is moderate to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is medium, and the hazard of water

erosion is moderate. The hazard of soil blowing is moderate.

The Milok soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone. Typically, the surface layer is yellowish red loamy fine sand about 3 inches thick. The subsoil is yellowish red fine sandy loam about 7 inches thick. The upper 15 inches of the substratum is yellowish red fine sandy loam, and the lower part to a depth of 60 inches or more is pink or reddish yellow fine sandy loam that is 10 percent pebbles. A layer of calcium carbonate accumulation is at a depth of 10 to 20 inches.

Permeability of the Milok soil is moderately rapid. Available water capacity is about 5.5 to 8.5 inches. Water supplying capacity is 4 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

Rock outcrop consists of barren or nearly barren areas of exposed bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Wayneco soil is 15 percent grasses, 25 percent forbs, and 60 percent shrubs. Important plants are blackbrush, Indian ricegrass, galleta, and Bigelow sagebrush.

The potential plant community on the Milok soil is 45 percent grasses, 15 percent forbs, and 40 percent shrubs. Important plants are galleta, Indian ricegrass, sand dropseed, needleandthread, fourwing saltbush, blackbrush, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow depth of the Wayneco soil.

This map unit is in capability subclass VIIs, nonirrigated. The Wayneco soil is in the Semidesert Shallow Sandy Loam (Blackbrush) range site, and the Milok soil is in the Semidesert Sandy Loam (Blackbrush) range site. Rock outcrop is not placed in a range site.

119—Wayneco-Rizno-Rock outcrop complex. This map unit is on mesas, benches, and hillsides. Slopes are 2 to 30 percent, are convex, and are medium in length. The present vegetation in most areas is mainly blackbrush, Mormon-tea, rabbitbrush, broom snakeweed, and galleta. Elevation is 5,000 to 5,500 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 48 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 40 percent Wayneco fine sandy loam, 2 to 30 percent slopes; 40 percent Rizno channery fine sandy loam, 2 to 30 percent slopes, eroded; 10 percent Rock outcrop; and 10 percent other soils.

Included in this unit is about 10 percent Mido loamy fine sand.

The Wayneco soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from sandstone. Typically, the surface layer is light reddish brown fine sandy loam about 4 inches thick. The underlying material to a depth of 16 inches is pinkish white fine sandy loam. Sandstone is at a depth of 16 inches. A layer of calcium carbonate accumulation is at a depth of 4 to 9 inches. Depth to sandstone ranges from 10 to 20 inches.

Permeability of the Wayneco soil is moderate to the restrictive layer. Available water capacity is about 1 inch to 2 inches. Water supplying capacity is 2 to 3 inches. Effective rooting depth is 10 to 12 inches. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

The Rizno soil is very shallow and well drained. It formed in residuum and colluvium derived dominantly from sandstone. Typically, the surface layer is light reddish brown channery fine sandy loam about 1 inch thick. The underlying material to a depth of 7 inches is pinkish gray channery fine sandy loam. Sandstone is at a depth of 7 inches. Depth to sandstone ranges from 6 to 10 inches.

Permeability of the Rizno soil is moderately rapid to the restrictive layer. Available water capacity is about 0.5 to 1.0 inch. Water supplying capacity is 2 inches. Effective rooting depth is 6 to 10 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

Rock outcrop consists of barren or nearly barren areas of exposed bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Wayneco soil is 15 percent grasses, 25 percent forbs, and 60 percent shrubs. Important plants are blackbrush, galleta, and Mormon-tea.

The potential plant community on the Rizno soil is 25 percent grasses, 10 percent forbs, and 65 percent shrubs. Important plants are galleta, blackbrush, and Mormon-tea.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant

community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the shallow and very shallow depth of the soils.

This map unit is in capability subclass VIIs, nonirrigated. The Wayneco soil is in the Semidesert Shallow Sandy Loam (Blackbrush) range site, and the Rizno soil is in the Semidesert Very Shallow Sandy Loam (Blackbrush) range site. Rock outcrop is not placed in a range site.

120—Windwhistle-Rock outcrop complex. This map unit is on mesas. Slopes are 2 to 8 percent and are medium in length. The present vegetation in most areas is mainly Indian ricegrass, galleta, blue grama, Mormon-tea, snakeweed, and scattered Utah juniper and pinyon. Some areas have been chained and seeded to other species. Elevation is 5,600 to 6,800 feet. The average annual precipitation is about 8 to 12 inches, the average annual air temperature is 47 to 50 degrees F, and the freeze-free period is 110 to 150 days.

This unit is 55 percent Windwhistle loamy very fine sand, 2 to 8 percent slopes; 30 percent Rock outcrop; and 15 percent other soils.

Included in this unit is about 15 percent Travessilla fine sandy loam.

The Windwhistle soil is moderately deep and well drained. It formed in residual and eolian deposits derived dominantly from sandstone. Typically, the surface layer is brown loamy very fine sand about 2 inches thick. The subsoil is brown very fine sandy loam about 18 inches thick. The underlying material to a depth of 28 inches is brown very fine sandy loam. Sandstone is at a depth of 28 inches. Depth to sandstone ranges from 20 to 40 inches.

Permeability of the Windwhistle soil is moderately rapid to the restrictive layer. Available water capacity is about 3 to 6 inches. Water supplying capacity is 4 to 7 inches. Effective rooting depth is 20 to 40 inches. The organic matter content of the surface layer is about 0.5 to 1.0 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

Rock outcrop consists of barren or nearly barren areas of exposed bedrock. It occurs mainly as nearly vertical cliffs and ledges.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Windwhistle soil is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are Indian ricegrass, needleandthread, galleta, fourwing saltbush, and winterfat.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor at the lower elevations and poor at the higher elevations. The main limitations are low to moderately low precipitation, the moderate depth of the soil, and the areas of Rock outcrop.

Undesirable plants can be controlled by chaining, burning, or spraying with chemicals. Drilling of seed is preferable and results in better stands of forage. If broadcast seeding is used, it is a good practice to cover the seed by pulling a Dixie harrow, anchor chain, or other similar equipment over the area. Plants other than native species that are suitable for seeding include Siberian wheatgrass, crested wheatgrass, Russian wildrye, fourwing saltbush, and winterfat.

This map unit is in capability subclass VIIe, nonirrigated. The Windwhistle soil is in the Semidesert Sandy Loam range site. Rock outcrop is not placed in a range site.

121—Yarts fine sandy loam, 1 to 3 percent slopes. This very deep, well drained soil is on benches and alluvial fans. It formed in alluvium derived dominantly from sandstone. Slopes are linear and long. The present vegetation in most areas is mainly Indian ricegrass, galleta, needleandthread, yellowbrush, and Mormon-tea. Elevation is 5,200 to 5,900 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 48 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is reddish brown fine sandy loam 8 inches thick. The upper 26 inches of the underlying material is light reddish brown fine sandy loam. The next 15 inches is light reddish brown sandy loam, and the lower part to a depth of 60 inches or more is pink sandy loam and fine sandy loam. A layer of calcium carbonate accumulation is at a depth of 49 to 60 inches.

Included in this unit is about 25 percent soils that are similar to this Yarts soil but have a clay layer below a depth of 40 inches, soils that have a sandy layer below a depth of 24 inches, and soils at King Ranch that have a grayish brown silty clay loam surface layer that has been silted by irrigation water.

Permeability of this Yarts soil is moderately rapid. Available water capacity is about 6.0 to 8.5 inches. Water supplying capacity is 5 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used mainly as irrigated cropland. It is also used as rangeland and wildlife habitat.

The potential plant community is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are needleandthread, Indian ricegrass, winterfat, fourwing saltbush, and galleta.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

The main crops grown are alfalfa, alfalfa-grass, small grain, and corn for silage. A suitable crop rotation consists of alfalfa or alfalfa-grass, corn for silage, and small grain. The grain and corn should not be grown more than 30 percent of the rotation time. Use of crop residue and commercial fertilizer maintains good soil tilth and fertility. Fertility levels can be checked by the use of soil fertility tests. Weed control by mechanical or chemical means is essential to maintain good production and a favorable plant community.

In some areas the supply of irrigation water is inadequate after midseason. Sprinkler irrigation is the most suitable method of applying water. Use of this method permits the even, controlled application of water, reduces runoff, and minimizes the risk of erosion. Furrow or corrugation systems are also suited to this unit. If furrow irrigation is used, water should be applied at frequent intervals and runs should be short. Water should be applied in amounts sufficient to wet the root zone but in amounts small enough to minimize the leaching of plant nutrients. Grazing when the soil is moist results in compaction of the surface layer, poor tilth, and excessive runoff.

If irrigated, this unit can produce about 10 tons of alfalfa hay per acre.

This map unit is in capability unit IIs-26, irrigated, and capability subclass VIIs, nonirrigated. It is in Semidesert Sandy Loam range site. The soil in this unit, where irrigation water is adequate, is prime farmland.

122—Yarts fine sandy loam, 3 to 8 percent slopes. This very deep, well drained soil is on alluvial fans, on benches, and in alluvial valleys. It formed in alluvium derived dominantly from sandstone. Slopes are linear and long in some areas; in others, they are concave to convex and are medium in length. The present vegetation in most areas is mainly galleta, needleandthread, Indian ricegrass, Mormon-tea, winterfat, and sand dropseed. Elevation is 5,200 to 6,000 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 48 to 50 degrees F, and the freeze-free period is 120 to 150 days.

Typically, the surface layer is yellowish red fine sandy loam about 3 inches thick. The underlying material to a depth of 60 inches or more is yellowish red and reddish brown fine sandy loam.

Included in this unit are about 10 percent Yarts loamy fine sand, bedrock substratum; 5 percent Begay fine sandy loam; and 5 percent Mido loamy fine sand. Also included are small areas of Glenberg family soils on bottoms.

Permeability of the Yarts soil is moderately rapid. Available water capacity is about 6.0 to 8.5 inches. Water supplying capacity is 5 to 6 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used as rangeland and wildlife habitat.

The potential plant community is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are needleandthread, Indian ricegrass, winterfat, fourwing saltbush, and galleta.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitation is low precipitation.

This map unit is in capability subclass VIIe, nonirrigated. It is in the Semidesert Sandy Loam range site.

123—Yarts-Mido complex. This map unit is on alluvial fans and benches. Slopes are 2 to 8 percent, are concave to convex, and are short. The present vegetation in most areas is mainly needleandthread, galleta, Indian ricegrass, Mormon-tea, and fourwing saltbush. Elevation is 5,200 to 5,400 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 48 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 50 percent Yarts loamy fine sand, bedrock substratum, 2 to 8 percent slopes; 25 percent Mido loamy fine sand, dry, 2 to 4 percent slopes, eroded; and 25 percent other soils and Rock outcrop.

Included in this unit are about 15 percent Moenkopie fine sandy loam and 10 percent Rock outcrop.

The Yarts soil is deep and well drained. It formed in alluvial and eolian deposits derived dominantly from sandstone. Typically, the surface layer is light reddish brown loamy fine sand about 3 inches thick. The upper 19 inches of the underlying material is reddish brown fine sandy loam, and the lower part to a depth of 48 inches is light reddish brown fine sandy loam. Sandstone is at a

depth of 48 inches. Depth to sandstone ranges from 40 to 60 inches.

Permeability of the Yarts soil is moderately rapid to the restrictive layer. Available water capacity is about 4.5 to 7.0 inches. Water supplying capacity is 3 to 6 inches. Effective rooting depth is 40 to 60 inches. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Mido soil is very deep and excessively drained. It formed in eolian deposits derived dominantly from sandstone. Typically, the soil is reddish brown loamy fine sand to a depth of 60 inches or more.

Permeability of the Mido soil is rapid. Available water capacity is about 3.5 to 6.0 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Yarts soil is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are Indian ricegrass, needleandthread, winterfat, fourwing saltbush, and galleta.

The potential plant community on the Mido soil is 50 percent grasses, 20 percent forbs, and 30 percent shrubs. Important plants are Indian ricegrass, dropseed, galleta, needleandthread, fourwing saltbush, Mormon-tea, and sand sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the sandy texture of the Mido soil.

This map unit is in capability subclass VIIe, nonirrigated. The Yarts soil is in the Semidesert Sandy Loam range site, and the Mido soil is in the Semidesert Sand range site.

124—Yarts-Mido complex, eroded. This map unit is on benches. Slopes are 2 to 15 percent, are concave to convex, and are short. The present vegetation in most areas is mainly Indian ricegrass, wavyleaf oak, sand sagebrush, sandhill muhly, and broom snakeweed. Elevation is 5,000 to 6,000 feet. The average annual precipitation is about 8 to 10 inches, the average annual air temperature is 48 to 50 degrees F, and the freeze-free period is 120 to 150 days.

This unit is 60 percent Yarts loamy fine sand, bedrock substratum, 2 to 8 percent slopes, severely eroded; 30 percent Mido loamy fine sand, hummocky, 4 to 15 percent slopes; and 10 percent other soils and Rock outcrop.

Included in this unit are about 5 percent Rizno fine sandy loam and 5 percent Rock outcrop.

The Yarts soil is deep and well drained. It formed in alluvial and eolian deposits derived dominantly from sandstone. Typically, the surface layer is light reddish brown loamy fine sand about 3 inches thick. The underlying material to a depth of 54 inches is reddish brown fine sandy loam. Sandstone is at a depth of 54 inches. Depth to sandstone ranges from 40 to 60 inches.

Permeability of the Yarts soil is moderately rapid to the restrictive layer. Available water capacity is about 5.0 to 7.5 inches. Water supplying capacity is 3 to 6 inches. Effective rooting depth is 40 to 60 inches. The organic matter content of the surface layer is about 1 to 2 percent. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Mido soil is very deep and excessively drained. It formed in eolian deposits derived dominantly from sandstone. Typically, the soil is reddish brown loamy fine sand to a depth of 60 inches or more.

Permeability of the Mido soil is rapid. Available water capacity is about 3 to 6 inches. Water supplying capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is about 0.15 to 0.50 percent. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

This unit is used as rangeland and wildlife habitat.

The potential plant community on the Yarts soil is 45 percent grasses, 20 percent forbs, and 35 percent shrubs. Important plants are Indian ricegrass, needleandthread, winterfat, and fourwing saltbush.

The potential plant community on the Mido soil is 50 percent grasses, 20 percent forbs, and 30 percent shrubs. Important plants are Indian ricegrass, dropseed, galleta, needleandthread, fourwing saltbush, Mormon-tea, and sand sagebrush.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases; therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Practices needed to maintain or improve the vegetation include a planned grazing system, proper grazing use, good water distribution, and proper season of use. Suitability for seeding is very poor. The main limitations are low precipitation and the sandy texture of the Mido soil.

This map unit is in capability subclass VIIe, nonirrigated. The Yarts soil is in the Semidesert Sandy Loam range site, and the Mido soil is in the Semidesert Sand range site.

Prime Farmland

In this section, prime farmland is defined and discussed and the prime farmland soils in this survey area are listed.

Prime farmland is of major importance in providing the nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, state, and federal levels, as well as individuals, must encourage and facilitate the wise use of our nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to producing food, seed, forage, fiber, and oilseed crops. Such soils have properties that are favorable for the economic production of sustained high yields of crops. The soils need only to be treated and managed using acceptable farming methods. Adequate moisture and a sufficiently long growing season are required. Prime farmland soils produce the highest yields with minimal inputs of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils may presently be in use as cropland or pasture or they may be in other uses. They either are used for producing food and fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Public land is land not available for farming in national forests, national parks, military reservations, and state parks.

Prime farmland soils commonly get an adequate and dependable supply of moisture from irrigation. Temperature and length of growing season are favorable, and level of acidity or alkalinity is acceptable. The soils have few, if any, rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not flooded during the growing season. The slope ranges mainly from 0 to 6 percent.

Soils that have a high water table, are subject to flooding, or are droughty may qualify as prime farmland soils if the limitations are overcome by drainage, flood control, or irrigation. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More information on the criteria for prime farmland soils can be obtained at the local office of the Soil Conservation Service.

About 4,000 acres, or about 0.2 percent, of the survey area would meet the requirements for prime farmland if an adequate and dependable supply of irrigation water were available.

The following map units meet the soil requirements for prime farmland when irrigated. On some soils included in the list, measures should be used to overcome a hazard or limitation, such as flooding, wetness, or droughtiness. The location of each map unit is shown on the detailed soil maps at the back of this publication. Soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

12 Billings Variant clay
13 Blackston fine sandy loam
41 Jocity loam
42 Jocity clay
111 Trachute loamy fine sand, 2 to 8 percent slopes
114 Trail loam
121 Yarts fine sandy loam, 1 to 3 percent slopes

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland and for engineering purposes.

In the capability system, soils generally are grouped at three levels: capability class, subclass, and unit (*4*). These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units generally are designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-6.

The capability classification of each map unit is given in the section "Detailed Soil Map Units."

Rangeland and Woodland Understory Vegetation

Rangeland is an important resource in this survey area. About 97 percent of the area is used as rangeland. The vegetation in most areas is perennial grasses, shrubs, and forbs, but in some areas there is a cover of aspen, maple, oak, and coniferous trees.

The main use of rangeland is for grazing by cattle. Water is supplied by streams, developed springs, wells, and seeps and generally is not adequately distributed. The native vegetation in many parts of the survey area has been greatly depleted by continued excessive use. Much of the acreage that was once open grassland is now covered by annuals and shrubs. Productivity of the range can be increased by using management practices such as planned grazing systems, brush management, fencing, water development, and seeding where feasible. The practices used or recommended for use should be selected according to the kinds of soil, the range sites in which the soils are located, and the specific type of ranch operation that will be conducted.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on grazing sites are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Table 4 shows, for each soil, the grazing site; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. Only those soils that are used as grazing sites or are suited to use as grazing sites are listed. Explanation of the column headings in table 4 follows.

A *grazing site* is a distinctive kind of land that produces a characteristic natural plant community that differs from natural plant communities on other grazing sites in kind, amount, and proportion of forage plants. The relationship between soils and vegetation was established during this survey; thus, grazing sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of forage plants. Soil reaction, salt content, and a seasonal water table are also important.

Understory vegetation consists of grasses, forbs, shrubs, and other plants. Some woodland, if well managed, can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the trees. The quantity and quality of understory vegetation vary with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, and the depth and condition of the litter. The density of the canopy determines the amount of light that understory plants receive.

Total production is the amount of vegetation that can be expected to grow annually on well managed land that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Dry weight is the total annual yield per acre of air-dry vegetation. Yields are adjusted to a common percent of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as exposure, amount of shade, recent rains, and unseasonable dry periods.

Characteristic vegetation—the grasses, grasslike plants, forbs, and shrubs that make up most of the potential natural plant community on each soil—is listed by common name. Under *composition*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. Because only key species are listed, the percentages do not necessarily total 100. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season. Generally, all of the vegetation produced is not used.

Grazing site management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present condition. Grazing site condition is determined by comparing the present plant community with the potential natural plant community on a particular grazing site. The more closely the existing community resembles the potential community, the better the grazing site condition. Grazing site condition is an ecological rating only. It does not have a specific meaning that pertains to the present plant community in a given use.

The objective in grazing site management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, reduction of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, a grazing site condition somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Recreation

A major recreational use of this survey area is hunting areas for deer and buffalo. Popular game birds in the

survey area are pheasant, grouse, quail, mourning dove, and waterfowl.

Lake Powell and the Green River provide opportunities for boating, water skiing, fishing, and swimming for residents and tourists.

Capitol Reef National Park, Glen Canyon National Recreation area, Canyonlands National Park, and the Henry Mountains are popular areas for camping, hiking, picnicking, and sightseeing.

The soils of the survey area are rated in table 5 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 5, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties generally are favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils are gently sloping and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Table 5 also shows the degree and the kind of soil limitations that affect septic tank absorption fields, local roads and streets, and dwellings without basements. The limitations are considered *slight* if soil properties and site features generally are favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills generally are limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Dwellings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can

cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building Site Development, Sanitary Facilities, Construction Materials, and Water Management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps and soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Construction Materials

Table 6 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel, or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or

many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 6, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the taxonomic unit descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a *probable* source has a layer of clean sand or gravel or a layer of sand or gravel that is as much as 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an *improbable* source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils generally is preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features listed in tables are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

The interpretative data relating to soil properties of the soil families are for pint data. These data cannot be extrapolated to make interpreations for the map unit. They are only reliable at the point that was described unless further field testing is done for each family. The point data can be used as a reference for the kind of use and management of these soils but does not infer the same degree of reliability present at the phase of a series.

Engineering Index Properties

Table 7 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 to 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each taxonomic unit under "Taxonomic Units and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added; for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the system adopted by the American Association of State Highway and Transportation Officials (*1*) and the Unified soil classification system (*2*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification; for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 8 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Taxonomic Units and Their Morphology."

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of the soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of

less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, more than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, very fine sand, sand, and organic matter (as much as 4 percent) and on soil structure and permeability. The estimates are modified by the presence of rock fragments. Values of K range from 0.02 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion.

Erosion factor T is an estimate of the maximum average rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion and the amount of soil lost. Soils are grouped according to the amount of stable aggregates 0.84 millimeters in size. These are represented idealistically by USDA textural classes. Soils containing rock fragments can occur in any group.

1. Sand, fine sand, and very fine sand. These soils generally are not suitable for crops. They are extremely erodible, and vegetation is difficult to establish on them.

2. Loamy sand, loamy fine sand, and loamy very fine sand. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Sandy loam, coarse sandy loam, fine sandy loam, and very fine sandy loam. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clay, silty clay, clay loam, and silty clay loam that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Loamy soils that are less than 20 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loam and sandy clay that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Loamy soils that are 20 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loam. These soils are very slightly erodible. Crops can easily be grown.

7. Silty clay loam that is less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to wind erosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 8, the estimated content of organic matter of the plow layer is expressed as a percentage, by weight, of the soil material; that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 9 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sand or gravelly sand. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay that has high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflow from streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after

rainfall or snowmelt is not considered to be flooding. Standing water in swamps and marshes or in closed depressional areas is considered to be ponding.

Table 9 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable period of flooding are estimated. Frequency is expressed as *none, rare, occasional*, and *frequent*. *None* means that flooding is not probable, *rare* that it is unlikely but is possible under unusual weather conditions (chance of flooding in any year is 0 to 5 percent), *occasional* that it occurs infrequently under normal weather conditions (chance of flooding in any year is 5 to 50 percent), and *frequent* that it occurs often under normal weather conditions (chance of flooding in any year is more than 50 percent).

Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that flooding is most likely to occur is expressed in months. November-May, for example, means that flooding can occur during the period November through May. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons, which are characteristic of soils that are not subject to flooding.

Also considered are local information about the extent and level of flooding and the relation of each soil on the landscape to historic flood. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

A cemented pan is a cemented or indurated subsurface layer at a depth of 5 feet or less. Such a pan causes difficulty in excavation. Pans are classified as thin or thick. A *thin* pan is one that is less than 3 inches thick if continuously indurated or less than 18 inches thick if discontinuous or fractured. Excavations can be made by trenching machines, backhoes, or small rippers. A *thick* pan is one that is more than 3 inches thick if continuously indurated or more than 18 inches thick if it is discontinuous or fractured. Such a pan is so thick or massive that blasting or special equipment is needed in excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*5*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 10 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Psamment (*Psamm*, meaning sand, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Torripsamment (*Torri*, meaning hot and dry, plus *psamment*, the suborder of the Entisols that has a dry moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Torripsamments.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, thickness of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is mixed, mesic Typic Torripsamments.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Taxonomic Units and Their Morphology

In this section, each taxonomic unit recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each unit. A pedon, a small three-dimensional area of soil, that is typical of the unit in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual* (*3*). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (*5*). Unless otherwise stated, colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the unit.

The map units of each taxonomic unit are described in the section "Detailed Soil Map Units."

Arches Series

The Arches series consists of shallow, excessively drained, rapidly permeable soils on hillsides. These soils formed in residual and eolian material derived from sandstone. Slopes are 8 to 30 percent. Elevation is 6,000 to 6,400 feet. Average annual precipitation is 9 to 11 inches, and average annual air temperature is 45 to 50 degrees F.

These soils are mixed, mesic Lithic Torripsamments.

Typical pedon of an Arches loamy fine sand, 8 to 30 percent slopes, eroded, in an area of Rock outcrop-

Arches complex, about 28 miles southeast of Hanksville, in the SE1/4 of sec. 18, T. 30 S., R. 15 E.

A1—0 to 4 inches; yellowish red (5YR 5/6) loamy fine sand, reddish brown (5YR 4/4) moist; single grain; loose; few very fine roots; mildly alkaline (pH 7.8); clear smooth boundary.

C1—4 to 14 inches; yellowish red (5YR 5/6) loamy fine sand, reddish brown (5YR 4/4) moist; single grain; loose; few very fine and fine roots; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 7.9); abrupt smooth boundary.

R—14 inches; sandstone.

Bedrock is at a depth of 10 to 20 inches. The profile has value of 5 or 6 when dry and 4 or 5 when moist, and it has chroma of 4 or 5.

C horizon: Clay content is 3 to 8 percent.

Begay Series

The Begay series consists of very deep, well drained, moderately rapidly permeable soils on benches, alluvial fans, and mesas and in valleys. These soils formed in alluvial and eolian material derived from sandstone. Slopes are 2 to 8 percent. Elevation is 5,000 to 6,400 feet. Average annual precipitation is 8 to 11 inches, and average annual air temperature is 47 to 52 degrees F.

These soils are coarse-loamy, mixed, mesic Ustollic Camborthids.

Typical pedon of Begay loamy fine sand, 2 to 8 percent slopes, about 23 miles east of Hanksville, in the center of sec. 8, T. 27 S., R. 15 E.

A1—0 to 5 inches; reddish brown (5YR 5/4) loamy fine sand, reddish brown (5YR 4/4) moist; single grain; loose; very few fine roots; few fine interstitial pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); abrupt smooth boundary.

B2—5 to 12 inches; reddish brown (5YR 5/4) very fine sandy loam, reddish brown (5YR 4/4) moist; weak subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

C1—12 to 36 inches; reddish yellow (5YR 6/6) fine sandy loam, yellowish red (5YR 4/6) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots; few fine tubular pores; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); gradual smooth boundary.

C2ca—36 to 60 inches; light reddish brown (5YR 6/4) fine sandy loam, reddish brown (5YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; very few fine roots; very few fine tubular pores; strongly calcareous; soft masses and veins of calcium carbonate; moderately alkaline (pH 8.4).

A1 horizon: Texture is loamy fine sand or fine sandy loam. Hue is 5YR, value is 5 or 6 when dry and 4 when moist, and chroma is 4 to 6.

B2 horizon: Texture is very fine sandy loam or fine sandy loam. Clay content is 12 to 15 percent. Hue is 5YR, value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 8.

C horizon: Texture is fine sandy loam or sandy loam, and in some pedons below a depth of 30 inches, it is loamy fine sand. Clay content is 5 to 12 percent. Hue is 5YR or 2.5YR, value is 6 or 7 when dry and 4 or 5 when moist, and chroma is 4 to 8.

Billings Series

The Billings series consists of very deep, well drained, slowly permeable soils in alluvial valleys and on flood plains and alluvial fans. These soils formed in alluvium derived dominantly from shale and sandstone. Slopes are 0 to 4 percent. Elevation is 4,250 to 4,800 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 50 to 53 degrees F.

These soils are fine-silty, mixed (calcareous), mesic Typic Torrifluvents.

Typical pedon of Billings silt loam, about 8 miles west of Hanksville, about 2,700 feet south and 1,100 feet west of the northeast corner of sec. 20, T. 28 S., R. 10 E.

A1—0 to 1 inch; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak platy structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; common fine vesicular pores; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); clear smooth boundary.

C1—1 to 4 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); abrupt smooth boundary.

C2—4 to 36 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, sticky and plastic; very few fine roots; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); gradual wavy boundary.

C3—36 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, sticky and plastic; few fine and very fine roots; strongly calcareous; veins and splotches of calcium carbonate; moderately alkaline (pH 8.4).

A1 horizon: Texture is silty clay loam or silt loam.

A and C horizons: Hue is 2.5Y or 5Y, value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 2 to 4.

C1 horizon: Texture is dominantly silty clay loam, but strata of clay loam, silt loam, and very fine sandy loam are present in some pedons, mainly below a depth of about 40 inches. Clay content of the 10- to 40-inch particle size control section averages 27 to 35 percent. Reaction is moderately alkaline or strongly alkaline.

Billings Variant

The Billings Variant consists of very deep, well drained, slowly permeable soils on alluvial fans. These soils formed in alluvium derived from shale. Slopes are 1 to 2 percent. Elevation is 4,250 to 4,700 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 50 to 53 degrees F.

These soils are fine, mixed (calcareous), mesic Typic Torrifluvents.

Typical pedon of Billings Variant clay, near Hanksville, in the SE1/4 of sec. 16, T. 28 S., R. 11 E.

A11—0 to 4 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; weak fine granular structure; slightly hard, firm, sticky and plastic; few fine roots; common very fine pores; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); abrupt smooth boundary.

A12—4 to 8 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few fine roots; common very fine pores; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); clear wavy boundary.

C1—8 to 14 inches; brown (10YR 5/3) clay, dark grayish brown (10YR 4/2) moist; massive; hard, firm, sticky and plastic; few fine roots; very few fine pores; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear wavy boundary.

C2—14 to 46 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; moderate coarse subangular blocky structure; very hard, very firm, sticky and plastic; few fine roots; very few fine pores; strongly calcareous; disseminated calcium carbonate; strongly alkaline (pH 8.8); clear wavy boundary.

C3—46 to 60 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; moderate coarse subangular blocky structure; very hard, very firm, very sticky and very plastic; few fine roots; very few very fine pores; strongly calcareous; disseminated calcium carbonate; strongly alkaline (pH 8.6).

A1 horizon: Hue is 10YR or 2.5Y, value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 2 or 3.

C horizon: Clay content is 40 to 50 percent. Hue is 10YR or 2.5Y, value is 4 to 6 when dry and 3 to 5 when moist, and chroma is 2 or 3. Reaction is moderately alkaline or strongly alkaline.

Blackston Series

The Blackston series consists of very deep, well drained, moderately permeable soils on upland terraces and rolling hillsides. These soils formed in alluvium derived from diorite and sandstone. Slopes are 2 to 30 percent. Elevation is 4,500 to 5,200 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 48 to 52 degrees F.

These soils are loamy-skeletal, mixed, mesic Typic Calciorthids.

Typical pedon of Blackston gravelly fine sandy loam, 4 to 8 percent slopes, about 12 miles south of Hanksville, near Fairview Ranch; about 2,700 feet west and 2,200 feet north of the southeast corner of sec. 8, T. 30 S., R. 11 E.

A1—0 to 4 inches; brown (10YR 5/3) gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak very fine and fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; common fine vesicular pores in surface crust; 15 to 35 percent pebbles; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); abrupt smooth boundary.

C1ca—4 to 15 inches; light brown (7.5YR 6/4) very cobbly clay loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; hard, firm, slightly sticky and plastic; few fine and medium roots; few fine pores; 15 percent pebbles and 30 percent cobbles; strongly calcareous; soft masses of calcium carbonate; strongly alkaline (pH 8.4); clear smooth boundary.

C2ca—15 to 25 inches; pale brown (10YR 6/3) very cobbly clay loam, light yellowish brown (10YR 6/4) moist; weak medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few fine roots; few fine pores; 40 percent cobbles and 15 percent pebbles; strongly calcareous; soft masses of calcium carbonate; strongly alkaline (pH 8.6); clear smooth boundary.

IIC3ca—25 to 60 inches; very pale brown (10YR 8/3) extremely cobbly loamy sand, brown (10YR 5/3) moist; single grain; loose; 40 percent cobbles and 25 percent pebbles; strongly calcareous; nodules and veins of calcium carbonate; strongly alkaline (pH 8.6).

The calcic horizon is at a depth of 4 to 8 inches. Depth to contrasting sand and pebbles ranges from 25 to 36 inches. The particle size control section has 35 to 65 percent rock fragments.

A1 horizon: Texture is gravelly fine sandy loam or fine sandy loam. Rock fragment content is 0 to 35 percent. Hue is 10YR or 7.5YR, value is 5 or 6 when dry and 4 when moist, and chroma is 3 or 4.

C horizon: Texture in the upper part is very cobbly clay loam or very cobbly loam that is 23 to 35 percent clay, and in the lower part it is extremely cobbly loamy sand that is 5 to 10 percent clay. Hue is 10YR or 7.5YR, value is 6 to 8 when dry and 4 to 6 when moist, and chroma is 2 to 4. Reaction is moderately alkaline or strongly alkaline.

Blazon Series

The Blazon series consists of shallow, well drained, moderately slowly permeable soils on upland fans. These soils formed in residuum and alluvium derived from shale. Slopes are 8 to 30 percent. Elevation is 6,500 to 7,500 feet. Average annual precipitation is 12 to 15 inches, and average annual air temperature is 40 to 45 degrees F.

These soils are loamy, mixed (calcareous), frigid, shallow Ustic Torriorthents.

Typical pedon of a Blazon cobbly clay loam, 8 to 30 percent slopes, in an area of Circleville-Blazon complex, about 26 miles south of Hanksville, in the SE1/4 of sec. 16, T. 33 S., R. 11 E.

A1—0 to 4 inches; grayish brown (10YR 5/2) cobbly clay loam, very dark grayish brown (10YR 3/2) moist; weak moderate subangular blocky structure parting to granular; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine and fine pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear wavy boundary.

C1—4 to 11 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 4/4) moist; weak coarse subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine, fine, and medium roots; common very fine and fine pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); abrupt smooth boundary.

C2r—11 inches; shale.

Paralithic contact is at a depth of 10 to 20 inches. Clay content is 30 to 35 percent.

A1 horizon: Rock fragment content is 25 to 35 percent.

Bowdish Series

The Bowdish series consists of moderately deep, well drained, moderately permeable soils on benches and mesas. These soils formed in residuum and alluvium derived from sandstone and siltstone. Slopes are 2 to 8 percent. Elevation is 5,000 to 5,600 feet. Average annual precipitation is 8 to 10 inches, and average annual air temperature is 47 to 50 degrees F.

These soils are fine-loamy, mixed, mesic Ustollic Calciorthids.

Typical pedon of Bowdish loamy fine sand, 4 to 8 percent slopes, about 11 miles southeast of Hanksville, about 800 feet east and 200 feet south of the northwest corner of sec. 16, T. 29 S., R. 14 E.

A1—0 to 2 inches; yellowish red (5YR 5/6) loamy fine sand, yellowish red (5YR 4/6) moist; single grain; loose, very friable; few fine roots; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

B2—2 to 7 inches; yellowish red (5YR 5/6) sandy loam, red (2.5YR 4/6) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few fine pores; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

C1ca—7 to 19 inches; red (2.5YR 5/6) sandy loam, red (2.5YR 4/6) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine pores; very strongly calcareous; masses and veins of calcium carbonate; moderately alkaline (pH 8.2); gradual wavy boundary.

C2—19 to 30 inches; red (2.5YR 4/6) channery loam, dark red (2.5YR 3/6) moist; massive; hard, firm, sticky and plastic; 20 percent channery fragments; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

C3r—30 inches; soft siltstone.

Paralithic contact is at a depth of 20 to 40 inches. The calcic horizon is at a depth of 6 to 15 inches. The particle size control section is 0 to 25 percent rock fragments.

A1 horizon: Hue is 5YR or 2.5YR, value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 6.

B2 horizon: Texture is sandy loam or loam. Clay content is 18 to 25 percent. Hue is 5YR or 2.5YR, value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 6.

C horizon: Texture is loam, channery loam, or sandy loam. Clay content is 18 to 25 percent. Hue is 5YR or 2.5YR, value is 4 to 7 when dry and 3 to 6 when moist, and chroma is 4 to 6. Reaction is moderately alkaline or strongly alkaline.

Bowdish Variant

The Bowdish Variant consists of deep, well drained, moderately permeable soils on mesas. These soils

formed in residuum derived from shale and sandstone. Slopes are 2 to 4 percent. Elevation is 4,900 to 6,000 feet. Average annual precipitation is 8 to 10 inches, and average annual air temperature is 47 to 50 degrees F.

These soils are fine-loamy, mixed, mesic Ustollic Calciorthids.

Typical pedon of Bowdish Variant fine sandy loam, about 15 miles west of Hanksville, about 1,300 feet west and 800 feet south of the northeast corner of sec. 24, T. 28 S., R. 8 E.

A1—0 to 3 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/3) moist; weak thin platy structure; slightly hard, very friable; few fine roots; very few fine pores; 5 to 10 percent channery fragments on the surface; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); clear wavy boundary.

Clca—3 to 20 inches; light brown (7.5YR 6/4) loam, brown (7.5YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and few medium roots; few fine and medium pores; about 5 percent sandstone channery fragments; strongly calcareous; splotches and veins of calcium carbonate; moderately alkaline (pH 8.4); clear wavy boundary.

C2ca—20 to 44 inches; light brown (7.5YR 6/4) loam, brown (7.5YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; very few fine pores; 5 to 10 percent fine sandstone channery fragments; very strongly calcareous; splotches and veins of calcium carbonate; moderately alkaline (pH 8.4); abrupt wavy boundary.

R—44 inches; sandstone.

Bedrock is at a depth of 40 to 60 inches. The calcic horizon is at a depth of 3 to 32 inches. Rock fragment content is 0 to 15 percent.

A1 horizon: Hue is 7.5YR or 10YR, value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 2 to 4.

C horizon: Texture is loam or sandy clay loam. Clay content is 20 to 30 percent. Hue is 7.5YR or 10YR, value is 6 or 7 when dry and 3 to 5 when moist, and chroma is 3 or 4.

Canyon Family

The Canyon family consists of shallow, well drained, moderately slowly permeable soils on hillsides and mountainsides. These soils formed in residuum and alluvium derived from shale and igneous rock. Slopes are 4 to 70 percent. Elevation is 5,200 to 7,900 feet. Average annual precipitation is 8 to 12 inches, and average annual air temperature is 45 to 50 degrees F.

These soils are loamy, mixed (calcareous), mesic, shallow Ustic Torriorthents.

Reference pedon of a Canyon family extremely bouldery clay loam in an area of Rock outcrop-Chipeta-Canyon family complex, about 43 miles south of Hanksville, in the NW1/4 of sec. 10, T. 35 S., R. 12 E.

A1—0 to 5 inches; brown (10YR 5/3) extremely bouldery clay loam, brown (10YR 4/3) moist; weak fine granular structure; slightly hard, friable, sticky and plastic; 70 percent cobbles, stones, and boulders; strongly calcareous; moderately alkaline (pH 8.4); gradual wavy boundary.

C1—5 to 18 inches; light yellowish brown (10YR 6/4) clay loam, brown (10YR 5/3) moist; massive; hard, firm, sticky and plastic; strongly calcareous; strongly alkaline (pH 8.8); clear smooth boundary.

Cr—18 inches; weathered shale.

Paralithic contact is at a depth of 5 to 20 inches. Clay content of the profile is 28 to 35 percent.

A1 horizon: Texture is extremely bouldery clay loam or very stony loam. Hue is 10YR to 5YR.

Cerrillos Series

The Cerrillos series consists of very deep, well drained, moderately slowly permeable soils on dissected alluvial fans and benches. These soils formed in alluvium derived from shale. Slopes are 4 to 15 percent. Elevation is 5,500 to 6,000 feet. Average annual precipitation is 8 to 11 inches, and average annual air temperature is 47 to 50 degrees F.

These soils are fine-loamy, mixed, mesic Ustollic Haplargids.

Typical pedon of a Cerrillos cobbly loam, 4 to 15 percent slopes, in an area of Cerrillos-Chipeta complex, about 30 miles south of Hanksville, in the NE1/4 of sec. 12, T. 33 S., R. 11 E.

A1—0 to 4 inches; reddish brown (5YR 5/4) cobbly loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure; soft, friable, sticky and plastic; about 30 percent diorite cobbles on the surface; calcareous; moderately alkaline (pH 8.4); clear wavy boundary.

B21t—4 to 11 inches; reddish brown (5YR 5/4) clay loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few fine patchy clay films and clay bridges on sand grains; calcareous; moderately alkaline (pH 8.4); abrupt wavy boundary.

C1ca—11 to 25 inches; pinkish white (5YR 8/2) clay loam, pinkish gray (5YR 7/2) moist; massive; very hard, firm, sticky and plastic; strongly calcareous; calcium carbonate is weakly cemented but not continuous; strongly alkaline (pH 8.5); gradual wavy boundary.

C2ca—25 to 60 inches; pinkish white (5YR 8/2) clay loam, pinkish gray (5YR 7/2) moist; massive; very hard, firm, sticky and plastic; calcareous; strongly alkaline (pH 8.5).

B and C horizons: Clay content is 28 to 35 percent.

Cerrillos Variant

The Cerrillos Variant consists of moderately deep, well drained, moderately slowly permeable soils on alluvial fans. These soils formed in alluvium derived from shale and sandstone. Slopes are 2 to 4 percent. Elevation is 4,800 to 4,900 feet. Average annual precipitation is 6 to 8 inches, and average annual air temperature is 50 to 52 degrees F.

These soils are fine-loamy, mixed, mesic Typic Haplargids.

Typical pedon of Cerrillos Variant loam, about 12 miles southwest of Hanksville, about 2,000 feet south and 500 feet west of the northeast corner of sec. 29, T. 29 S., R. 10 E.

A1—0 to 2 inches; light brownish gray (10YR 6/2) loam, dark brown (10YR 4/3) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; many fine vesicular pores; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); clear wavy boundary.

B21t—2 to 12 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; common fine and medium roots; common fine interstitial and tubular pores; thin patchy clay films; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); gradual wavy boundary.

B22tca—12 to 24 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few fine and medium roots; common fine interstitial and tubular pores; thin patchy clay films; strongly calcareous; splotches and veins of calcium carbonate; strongly alkaline (pH 8.6); clear wavy boundry.

Cca—24 to 36 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; few fine interstitial pores; strongly calcareous; splotches and veins of calcium carbonate; moderately alkaline (pH 8.2).

R—36 inches; sandstone.

Bedrock is at a depth of 20 to 40 inches. The calcic horizon is at a depth of 10 to 17 inches. The solum is 20 to 30 inches thick.

A1 horizon: Rock fragment content is 0 to 10 percent. Value is 6 when dry and 4 or 5 when moist, and chroma is 2 or 3.

B2t horizon: Texture is clay loam or loam. Clay content is 27 to 35 percent. Value is 5 when dry and 4 or 5 when moist, and chroma is 2 or 3. Reaction is moderately alkaline or strongly alkaline.

Cca horizon: Clay content is 20 to 27 percent. Value is 6 or 7 when dry and 5 or 6 when moist, and chroma is 2 or 3.

Chipeta Series

The Chipeta series consists of shallow, well drained, slowly permeable soils on mesas, benches, and low rolling hillsides on mesas and benches. These soils formed in residuum and colluvium derived from shale. Slopes are 2 to 60 percent. Elevation is 4,200 to 6,000 feet. Average annual precipitation is 5 to 10 inches, and average annual air temperature is 48 to 52 degrees F.

These soils are clayey, mixed (calcareous), mesic, shallow Typic Torriorthents.

Typical pedon of Chipeta gravelly silty clay, 30 to 60 percent slopes, about 14 miles southwest of Hanksville, about 1,000 feet south and 500 feet east of the northwest corner of sec. 12, T. 30 S., R. 10 E.

A1—0 to 3 inches; light brownish gray (2.5Y 6/2) gravelly silty clay, light olive brown (2.5Y 5/4) moist; moderate medium platy structure; slightly hard, firm, sticky and plastic; few fine roots; few fine vesicular pores; 15 percent pebbles; surface mantle of pebbles in most areas; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.0); clear smooth boundary.

C1—3 to 15 inches; light olive brown (2.5Y 5/4) silty clay loam, light olive brown (2.5Y 5/4) moist; weak medium prismatic structure parting to moderate fine subangular blocky; hard, firm, sticky and plastic; few fine roots; very few fine pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear diffuse boundary.

C2r—15 inches; decomposing shale.

Paralithic contact is at a depth of 8 to 20 inches.

A1 horizon: Texture is gravelly silty clay or silty clay. Rock fragment content is 0 to 25 percent. Hue is 2.5Y or 5Y, value is 5 or 6 when dry and 4 to 6 when moist, and chroma is 2 to 4.

C horizon: Texture is silty clay loam or silty clay. Clay content is 35 to 45 percent. Hue is 2.5Y or 5Y, value is 5 or 6 when dry and 3 to 5 when moist, and chroma is 2 to 4.

Chipeta Variant

The Chipeta Variant consists of moderately deep, well drained, slowly permeable soils on steep canyon foot slopes. These soils formed in alluvium and residuum derived from shale. Slopes are 15 to 40 percent. Elevation is 6,000 to 6,600 feet. Average annual precipitation is 8 to 10 inches, and average annual air temperature is 48 to 50 degrees F.

These soils are fine, mixed (calcareous), mesic Ustic Torriorthents.

Typical pedon of a Chipeta Variant clay loam in an area of Chipeta Variant-Badland-Rock outcrop complex, about 25 miles southeast of King's Ranch, about 1,500 feet west and 1,000 feet south of the northeast corner of sec. 10, T. 32 S., R. 9 E.

A1—0 to 4 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate fine granular structure; slightly hard, firm, sticky and slightly plastic; few fine roots; many very fine and few fine pores; 5 to 10 percent pebbles and 5 percent stones; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); abrupt smooth boundary.

C1—4 to 9 inches; light brownish gray (10YR 6/2) clay loam, grayish brown (10YR 5/2) moist; moderate medium subangular blocky structure; hard, firm, sticky and slightly plastic; many fine roots; few fine pores; 5 percent pebbles and 10 percent cobbles; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); gradual smooth boundary.

C2ca—9 to 22 inches; pale brown (10YR 6/3) cobbly silty clay loam, grayish brown (10YR 5/2) moist; moderate coarse angular blocky structure; hard, firm, sticky and plastic; few fine roots; few fine and medium pores; 10 percent pebbles and 15 percent cobbles; strongly calcareous; calcium carbonate is disseminated and in veins; strongly alkaline (pH 8.7); clear smooth boundary.

C3r—22 inches; weathering shale.

Paralithic contact is at a depth of 20 to 40 inches. Clay content of the particle size control section is 35 to 40 percent.

Circleville Series

The Circleville series consists of moderately deep, well drained, moderately permeable soils on upland fans and fan terraces. These soils formed in alluvium and residuum derived from diorite. Slopes are 8 to 30 percent. Elevation is 6,500 to 7,500 feet. Average annual precipitation is 12 to 15 inches, and average annual air temperature is 40 to 45 degrees F.

These soils are loamy-skeletal, mixed Aridic Argiborolls.

Typical pedon of a Circleville cobbly loam, 8 to 30 percent slopes, in an area of Circleville-Blazon complex, about 28 miles south and 5 miles west of Hanksville, about 2,640 feet east and 10 feet south of the northwest corner of sec. 29, T. 32 S., R. 10 E.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine pores; 15 to 30 percent pebbles and cobbles; moderately alkaline (pH 8.0); clear wavy boundary.

B1—4 to 7 inches; dark grayish brown (10YR 4/2) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate very coarse subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots and few medium roots; common very fine and fine pores; 35 to 40 percent pebbles and cobbles; mildly alkaline (pH 7.4); clear wavy boundary.

B2t—7 to 12 inches; brown (7.5YR 5/4) very cobbly clay loam, dark brown (10YR 4/3) moist; moderate very coarse subangular blocky structure; hard and very hard, friable and firm, very sticky and very plastic; common very fine and fine roots and few medium roots; common very fine and fine pores; 35 to 45 percent pebbles and cobbles; mildly alkaline (pH 7.6); clear wavy boundary.

Cca—12 to 36 inches; brown (7.5YR 5/4) very gravelly loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; common very fine and fine pores; 35 percent pebbles and cobbles; strongly calcareous; calcium carbonate is segregated; moderately alkaline (pH 8.2).

R—36 inches; unweathered diorite.

Bedrock is at a depth of 20 to 40 inches. Secondary calcium carbonate is at a depth of 10 to 20 inches. The particle size control section is 35 to 50 percent rock fragments.

A1 horizon: Hue is 7.5YR or 10YR, value is 4 or 5 when dry and 3 when moist, and chroma is 2 or 3. Rock fragment content is 15 to 35 percent.

B2t horizon: Clay content is 23 to 32 percent. Hue is 7.5YR or 10YR, value is 4 or 5 when dry and 4 when moist, and chroma is 2 to 4. Reaction is mildly alkaline or moderately alkaline.

Datino Family

The Datino family consists of moderately deep, well drained, moderately slowly permeable soils on mountainsides. These soils formed in alluvium and

colluvium derived from shale. Slopes are 30 to 50 percent. Elevation is 8,500 to 10,000 feet. Average annual precipitation is 20 to 25 inches, and average annual air temperature is 34 to 38 degrees F.

These soils are loamy-skeletal, mixed Typic Haploborolls.

Reference pedon of a Datino family loam, 30 to 50 percent slopes, in an area of Delson-Datino family complex, about 25 miles south of Hanksville, in the Henry Mountains, in the NW1/4 of sec. 10, T. 32 S., R. 10 E.

A1—0 to 10 inches; brown (10YR 5/3) loam, very dark gray (10YR 3/1) moist; weak coarse subangular blocky structure; slightly hard, friable, sticky and plastic; neutral (pH 6.8); clear wavy boundary.

B2—10 to 21 inches; brown (10YR 5/3) very gravelly clay loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; about 40 percent shaly pebbles; neutral (pH 7.0); abrupt wavy boundary.

R—21 inches; unweathered shale.

Paralithic contact is at a depth of 20 to 40 inches.

A1 horizon: Hue is 10YR or 2.5Y, value is 4 or 5 when dry and 3 when moist, and chroma is 1 to 3.

B2 horizon: Texture is very gravelly clay loam or very gravelly silty clay loam. Clay content is 27 to 35 percent. Rock fragment content is 35 to 50 percent. Hue is 2.5Y to 7.5YR, value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 2 to 4.

Delson Series

The Delson series consists of very deep, well drained, slowly permeable soils on mountainsides. These soils formed in alluvium derived from diorite, shale, and sandstone. Slopes are 15 to 50 percent. Elevation is 7,500 to 9,500 feet. Average annual precipitation is 16 to 22 inches, and average annual air temperature is 35 to 40 degrees F.

These soils are fine, montmorillonitic Typic Argiborolls.

Typical pedon of Delson cobbly loam, 15 to 30 percent slopes, about 22 miles south of Hanksville, in the Henry Mountains, about 2,640 feet east of the southwest corner of sec. 25, T. 31 S., R. 10 E.

A1—0 to 15 inches; dark grayish brown (10YR 4/2) cobbly loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine pores; 15 to 25 percent pebbles and cobbles; moderately alkaline (pH 8.0); clear smooth boundary.

B2t—15 to 40 inches; brown (7.5YR 5/4) cobbly clay, dark reddish brown (5YR 3/4) moist; moderate coarse subangular blocky structure; hard, firm, sticky and plastic; few fine and medium roots; common very fine and fine pores; 20 to 35 percent pebbles and cobbles; moderately alkaline (pH 8.0); clear smooth boundary.

C—40 to 60 inches; brown (7.5YR 5/4) very cobbly clay, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, sticky and plastic; very few fine and medium roots; common very fine and fine pores; 35 to 50 percent pebbles and cobbles; moderately alkaline (pH 8.0).

The particle size control section is 20 to 35 percent rock fragments. The mollic epipedon is 12 to 15 inches thick.

A1 horizon: Rock fragment content is 15 to 35 percent. Hue is 7.5YR or 10YR.

B2t horizon: Clay content is 40 to 50 percent. Rock fragment content is 20 to 35 percent. Hue is 7.5YR or 5YR, and value is 4 or 5 when dry and 3 or 4 when moist.

C horizon: Clay content is 40 to 50 percent. Rock fragment content is 40 to 50 percent.

Factory Series

The Factory series consists of moderately deep, well drained, moderately rapidly permeable soils on benches and alluvial fans. These soils formed in alluvium derived from diorite and sandstone. Slopes are 2 to 8 percent. Elevation is 5,100 to 5,300 feet. Average annual precipitation is 8 to 9 inches, and average annual air temperature is 47 to 50 degrees F.

These soils are coarse-loamy, carbonatic, mesic Ustollic Paleorthids.

Typical pedon of Factory sandy loam, 2 to 8 percent slopes, about 1.5 miles east of Trachyte Ranch, about 1,500 feet south and 1,000 feet east of the northwest corner of sec. 4, T. 33 S., R. 12 E.

A1—0 to 2 inches; yellowish red (5YR 5/6) sandy loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; loose, very friable, slightly sticky and slightly plastic; few fine and very fine roots; common medium vesicular pores; slightly calcareous; disseminated calcium carbonate; mildly alkaline (pH 7.7); clear smooth boundary.

B2—2 to 8 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine pores; strongly calcareous; disseminated calcium carbonate; mildly alkaline (pH 7.8); clear smooth boundary.

C1ca—8 to 18 inches; yellowish red (5YR 5/6) gravelly fine sandy loam, yellowish red (5YR 4/6) moist; massive; soft, very friable, slightly sticky and slightly

plastic; few fine and very fine roots; few fine and medium pores; 15 percent lime-coated pebbles; strongly calcareous; disseminated calcium carbonate and soft masses of calcium carbonate; moderately alkaline (pH 8.0); clear wavy boundary.

C2ca—18 to 29 inches; reddish yellow (5YR 6/6) gravelly sandy loam, yellowish red (5YR 5/6) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine roots; few fine pores; 20 percent pebbles and 10 percent cobbles; very strongly calcareous; calcium carbonate in hardpan fragments and in fine soft masses; strongly alkaline (pH 8.8); abrupt smooth boundary.

C3cam—29 inches; indurated, lime-cemented hardpan.

Secondary calcium carbonates are at a depth of 7 to 12 inches. The indurated, lime-cemented hardpan is at a depth of 20 to 40 inches. The control section is 0 to 30 percent rock fragments.

A1 and B2 horizons: Hue is 5YR or 7.5YR, value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 6.

Cca horizon: Texture is gravelly sandy loam, gravelly fine sandy loam, or gravelly loam. Clay content is 10 to 18 percent. Rock fragment content is 15 to 30 percent. Hue is 5YR or 7.5YR, value is 5 to 8 when dry and 4 to 7 when moist, and chroma is 3 to 6. Reaction is moderately alkaline or strongly alkaline.

Farb Series

The Farb series consists of shallow, excessively drained, moderately rapidly permeable soils on mesas, benches, and hillsides. These soils formed in residuum and alluvium derived from sandstone. Slopes are 2 to 30 percent. Elevation is 4,000 to 5,000 feet. Average annual precipitation is 6 to 8 inches, and average annual air temperature is 50 to 52 degrees F.

These soils are loamy, mixed (calcareous), mesic Lithic Torriorthents.

Typical pedon of a Farb fine sandy loam, 4 to 15 percent slopes, in an area of Farb-Rock outcrop complex, about 5 miles north and 2 miles east of Hanksville, about 2,500 feet south and 500 feet west of the northeast corner of sec. 26, T. 27 S., R. 11 E.

A1—0 to 1 inch; strong brown (7.5YR 5/6) fine sandy loam, strong brown (7.5YR 4/6) moist; weak fine subangular blocky structure; soft, very friable; few fine roots; 5 percent sandstone channery fragments on surface; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear wavy boundary.

C1—1 to 11 inches; reddish yellow (7.5YR 7/6) fine sandy loam, strong brown (7.5YR 4/6) moist; massive; soft, very friable; few fine roots; very few fine pores; 5 percent sandstone channery fragments; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear wavy boundary.

C2—11 to 19 inches; reddish yellow (7.5YR 6/6) fine sandy loam, strong brown (7.5YR 5/6) moist; massive; soft, very friable; few fine roots; very few fine pores; 5 to 15 percent sandstone channery fragments; very strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); abrupt wavy boundary.

R—19 inches; sandstone.

Bedrock is at a depth of 5 to 20 inches.

A1 horizon: Texture is fine sandy loam or channery sandy loam. Rock fragment content is 0 to 15 percent. Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 3 to 6.

C horizon: Texture is fine sandy loam or channery sandy loam. Clay content is 5 to 15 percent. Rock fragment content is 0 to 30 percent. Value is 5 to 7 when dry and 4 or 5 when moist, and chroma is 3 to 6.

Glenberg Family

The Glenberg family consists of very deep, well drained, moderately permeable soils on flood plains. These soils formed in alluvium derived from sandstone and shale. Slopes are 0 to 4 percent. Elevation is 3,800 to 6,000 feet. Average annual precipitation is 5 to 10 inches, and average annual air temperature is 48 to 52 degrees F.

These soils are coarse-loamy, mixed (calcareous), mesic Ustic Torrifluvents.

Reference pedon of a Glenberg family fine sandy loam, 0 to 2 percent slopes, in an area of Otero-Glenberg families complex, about 10 miles northwest of Hanksville, in the SE1/4 of sec. 30, T. 27 S., R. 10 E.

A1—0 to 3 inches; light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; thin platy and weak fine granular structure; soft, very friable; few fine roots; few fine tubular pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); clear smooth boundary.

C1—3 to 23 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores; slightly calcareous; disseminated calcium carbonate; strongly alkaline (pH 8.6); clear smooth boundary.

C2—23 to 44 inches; light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; few fine tubular pores; slightly calcareous; disseminated calcium carbonate;

moderately alkaline (pH 8.4); clear smooth boundary.

C3—44 to 60 inches; light yellowish brown (10YR 6/4) very fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; very few fine roots; few fine tubular pores; moderately calcareous; disseminated calcium carbonate; strongly alkaline (pH 8.6).

The profile commonly is fine sandy loam to loam that is 10 to 18 percent clay, but it includes thin layers that range from sand to clay. Hue is 2.5YR to 5Y, value is 5 to 7 when dry and 4 to 6 when moist, and chroma is 4 to 8. The profile is saline in some pedons. The water table is below a depth of 40 inches in some pedons.

Goblin Series

The Goblin series consists of shallow, well drained, moderately rapidly permeable soils on dissected uplands, pediment surfaces, and hillsides. These soils formed in residuum derived from gypsiferous shale and sandstone. Slopes are 2 to 30 percent. Elevation is 4,300 to 5,600 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 47 to 52 degrees F.

These soils are loamy, gypsic, mesic, shallow Typic Torriorthents.

Typical pedon of a Goblin loam, 2 to 30 percent slopes, severely eroded, in an area of Mivida-Goblin complex, about 28 miles west of Hanksville, in the NW1/4NE1/4 of sec. 1, T. 27 S., R. 6 E.

A1—0 to 3 inches; light reddish brown (2.5YR 6/4) loam, red (2.5YR 4/6) moist; weak fine granular structure; slightly hard, very friable; few fine roots; few fine tubular pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

Ccs—3 to 12 inches; yellowish red (5YR 5/6) loam, yellowish red (5YR 4/6) moist; weak fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores; common crystals and veins of gypsum; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); clear smooth boundary.

Cr—12 inches; gypsiferous shale.

Paralithic contact is at a depth of 5 to 20 inches. Rock fragment content is 0 to 35 percent. Hue is 2.5YR to 7.5YR.

A1 horizon: Value is 5 to 7 when dry and 4 or 5 when moist, and chroma is 4 to 6.

Ccs horizon: Texture is loam or fine sandy loam. Clay content is 12 to 18 percent. Value is 5 to 7 when dry and 4 or 5 when moist, and chroma is 4 to 6.

Green River Family

The Green River family consists of very deep, poorly drained, moderately rapidly permeable soils on flood plains. These soils formed in alluvium derived from sandstone and shale. Slopes are 0 to 2 percent. Elevation is 3,800 to 5,000 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 49 to 53 degrees F.

These soils are coarse-loamy, mixed (calcareous), mesic Aquic Ustifluvents.

Reference pedon of a Green River family loamy fine sand, 0 to 2 percent slopes, in an area of Green River-Myton families complex, about 55 miles south of Hanksville, in Bullfrog Basin, in the NE1/4NW1/4 of sec. 11, T. 37 S., R. 10 E.

A1—0 to 6 inches; light yellowish brown (10YR 6/4) loamy fine sand, yellowish brown (10YR 5/4) moist; single grain; loose, very friable; few fine roots; few fine interstitial pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.0); clear smooth boundary.

C1—6 to 20 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; few fine faint yellowish brown (10YR 5/8) mottles; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine, medium, and coarse roots; few fine tubular pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

C2—20 to 40 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, yellowish brown (10YR 5/4) moist; few fine faint yellowish brown (10YR 5/8) mottles; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine, medium, and coarse roots; few fine tubular pores; 25 percent pebbles and cobbles; moderately calcareous; disseminated calcium carbonate, with some segregation on pebbles; moderately alkaline (pH 8.2); clear wavy boundary.

C3—40 to 60 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; common fine distinct yellowish brown (10YR 5/8) mottles; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine, medium, and coarse roots; few fine tubular pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4).

The profile is stratified. The texture is mainly gravelly sandy loam, but it includes thin layers of clay to sand. The average clay content is 10 to 18 percent. Rock fragment content is 0 to 35 percent. Depth to the water table ranges from about 20 to 40 inches. The profile is moderately alkaline or strongly alkaline.

Hanksville Series

The Hanksville series consists of moderately deep, well drained, very slowly permeable soils on benches, alluvial fans, and dissected hillsides. These soils formed in alluvium derived from shale. Slopes are 0 to 15 percent. Elevation is 4,200 to 5,000 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 50 to 52 degrees F.

These soils are fine, mixed (calcareous), mesic Typic Torriorthents.

Typical pedon of a Hanksville clay loam, 0 to 4 percent slopes, eroded, in an area of Hanksville-Chipeta complex, about 7 miles west of Hanksville, about 2,000 feet west and 800 feet south of the northeast corner of sec. 16, T. 28 S., R. 10 E.

A1—0 to 7 inches; olive gray (5Y 4/2) clay loam, dark olive gray (5Y 3/2) moist; weak thick platy structure; hard, friable, slightly sticky and slightly plastic; very few fine roots; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

C1—7 to 18 inches; olive gray (5Y 4/2) clay loam, dark olive gray (5Y 3/2) moist; massive; hard, very firm, sticky and plastic; few very fine roots; few veins of salt and gypsum; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); gradual smooth boundary.

C2—18 to 39 inches; olive gray (5Y 4/2) silty clay, dark olive gray (5Y 3/2) moist; massive; hard, very firm, sticky and plastic; mycelia of salt and gypsum; moderately calcareous; calcium carbonate is in veins and disseminated; strongly alkaline (pH 8.6); clear wavy boundary.

Cr—39 inches; soft, fractured shale.

Paralithic contact is at a depth of 20 to 40 inches.

A1 horizon: Texture is clay loam or gravelly clay loam. Hue is 5Y or 2.5Y, value is 4 to 7 when dry and 3 to 5 when moist, and chroma is 1 to 4. Reaction is moderately alkaline or strongly alkaline.

C horizon: Texture is clay loam or silty clay. Clay content is 35 to 45 percent. Hue is 5Y or 2.5Y, value is 4 to 6 when dry and 3 to 5 when moist, and chroma is 1 to 3. Reaction is moderately alkaline or strongly alkaline.

Haverdad Series

The Haverdad series consists of very deep, well drained, moderately permeable soils in alluvial valleys. These soils formed in alluvium derived from sandstone and shale. Slopes are 0 to 2 percent. Elevation is 5,000 to 6,000 feet. Average annual precipitation is 8 to 10 inches, and average annual air temperature is 47 to 50 degrees F.

These soils are fine-loamy, mixed (calcareous), mesic Ustic Torrifluvents.

Typical pedon of Haverdad silt loam, about 23 miles west of Hanksville, about 1,400 feet north and 1,000 feet east of the southwest corner of sec. 23, T. 27 S., R. 7 E.

A1—0 to 9 inches; grayish brown (2.5Y 5/2) silt loam, dark grayish brown (2.5Y 4/2) moist; thick platy structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; common very fine and fine pores; moderately calcareous; disseminated calcium carbonate; strongly alkaline (pH 8.5); clear smooth boundary.

C1—9 to 16 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few fine roots; few fine and very fine pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); clear smooth boundary.

C2—16 to 21 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few fine roots; few fine and very fine pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.3); clear smooth boundary.

C3—21 to 34 inches; grayish brown (2.5Y 5/2) silt loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; common very fine and fine pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.0); clear smooth boundary.

C4—34 to 60 inches; grayish brown (2.5Y 5/2) silt loam, dark grayish brown (2.5Y 4/2) moist; massive; soft, friable, sticky and slightly plastic; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.3).

The profile has hue of 2.5Y or 10YR.

A1 horizon: Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 2 or 3.

C horizon: Texture is loam or silt loam that is 15 to 25 percent fine sand or coarser. Clay content is 18 to 27 percent. Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 2 or 3.

Jocity Series

The Jocity series consists of very deep, well drained, and moderately slowly permeable soils on alluvial fans and stream terraces. These soils formed in alluvium derived from sandstone and shale. Slopes are 1 to 2 percent. Elevation is 4,400 to 4,700 feet. Average annual precipitation is 5 to 7 inches, and average annual air temperature is 51 to 53 degrees F.

These soils are fine-loamy, mixed (calcareous), mesic Typic Torrifluvents.

Typical pedon of Jocity clay, about 1 mile north of Hanksville, in the SE1/4 of sec. 15, T. 28 S., R. 11 E.

Ap—0 to 13 inches; pinkish gray (7.5YR 6/2) clay, brown (7.5YR 4/2) moist; moderate medium subangular blocky structure; very hard, firm, sticky and plastic; common fine roots and few medium and coarse roots; few fine, common medium, and few coarse pores; moderately calcareous; strongly alkaline (pH 7.9); clear smooth boundary.

C1—13 to 44 inches; pinkish gray (7.5YR 6/2) clay loam, brown (7.5YR 4/2) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few fine and medium roots; few fine, medium, and coarse pores; moderately calcareous; strongly alkaline (pH 7.9); clear smooth boundary.

C2—44 to 52 inches; light brown (7.5YR 6/4) loam, brown (7.5YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); clear wavy boundary.

C3—52 to 56 inches; pinkish gray (7.5YR 6/2) loam, brown (7.5YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.0); clear wavy boundary.

C4—56 to 60 inches; pinkish gray (7.5YR 6/2) clay loam, brown (7.5YR 4/2) moist; massive; hard, firm, sticky and plastic; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.0).

The profile has hue of 5YR or 7.5YR.

Ap horizon: Texture is clay or loam. Value is 5 or 6 when dry, and chroma is 2 to 4.

C horizon: Texture is dominantly clay loam or loam in the 10- to 40-inch particle size control section, but it includes thin lenses of loam, fine sandy loam, clay loam, and silty clay loam. Clay content is 18 to 35 percent. Value is 5 or 6 when dry.

Leebench Series

The Leebench series consists of very deep, well drained, slowly permeable soils on alluvial fans, fan terraces, mesas, and benches. These soils formed in alluvium derived from shale, sandstone, and diorite. Slopes are 2 to 8 percent. Elevation is 4,400 to 5,200 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 48 to 52 degrees F.

These soils are fine-loamy, mixed, mesic Typic Natrargids.

Typical pedon of Leebench gravelly clay loam, 4 to 8 percent slopes, about 9 miles south of Hanksville, in the SE1/4NW1/4 of sec. 20, T. 29 S., R. 11 E.

A2—0 to 3 inches; very pale brown (10YR 7/3) gravelly clay loam, brown (10YR 5/3) moist; weak thin platy structure; hard, firm, sticky and plastic; few very fine, fine, and medium roots; many very fine and fine vesicular pores; 15 to 25 percent pebbles; strongly calcareous; disseminated calcium carbonate; very strongly alkaline (pH 9.0); clear irregular boundary.

B2tca—3 to 8 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 4/4) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; common fine and few medium roots; few fine interstitial pores; few thin clay films on pores and ped faces; strongly calcareous; splotches and veins of calcium carbonate; strongly alkaline (pH 9.0); clear smooth boundary.

C1ca—8 to 20 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 5/3) moist; massive; slightly hard, firm, sticky and plastic; few fine roots; very few fine pores; 15 to 30 percent pebbles; strongly calcareous; disseminated calcium carbonate and splotches of calcium carbonate; strongly alkaline (pH 9.0); gradual wavy boundary.

C2—20 to 60 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 5/3) moist; massive; hard, firm, sticky and plastic; very few fine roots; 20 to 35 percent pebbles; strongly calcareous; calcium carbonate is in veins; strongly alkaline (pH 9.0).

The solum is 11 to 24 inches thick. Secondary calcium carbonates are at a depth of 3 to 20 inches.

A2 horizon: Texture is gravelly clay loam or fine sandy loam. Rock fragment content is 5 to 30 percent. Hue is 10YR or 7.5YR, value is 5 to 7 when dry and 4 or 5 when moist, and chroma is 2 to 4. Reaction is strongly alkaline or very strongly alkaline.

B2t horizon: Clay content is 27 to 35 percent. Rock fragment content is 0 to 10 percent. Hue is 7.5YR or 10YR, value is 6 to 8 when dry and 4 or 5 when moist, and chroma is 3 or 4.

C horizon: Texture is gravelly clay loam or extremely gravelly sandy loam. Rock fragment content is 15 to 70 percent. Hue is 5YR or 10YR, value is 6 to 8 when dry and 4 to 6 when moist, and chroma is 2 to 4.

Makoti Family

The Makoti family consists of deep, well drained, slowly permeable soils on mountainsides. These soils formed in alluvium and colluvium derived from shale. Slopes are 30 to 50 percent. Elevation is 7,500 to 9,500 feet. Average annual precipitation is 16 to 18 inches, and average annual air temperature is 35 to 43 degrees F.

These soils are fine-silty, mixed Pachic Haploborolls.

Reference pedon of a Makoti family clay loam, 30 to 50 percent slopes, in an area of Delson-Makoti family complex, about 22 miles south of Hanksville, in the

Henry Mountains, 2,640 feet west of the NW1/4 of sec. 36, T. 31 S., R. 10 E.

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) clay loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure parting to granular; soft, friable, sticky and plastic; common fine and medium roots; few fine pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); clear smooth boundary.
B2—4 to 24 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark brown (10YR 2/2) moist; moderate coarse subangular blocky structure; hard, firm, very sticky and very plastic; common fine and medium roots; few fine pores; strongly calcareous; calcium carbonate is in veins and as coatings on peds; moderately alkaline (pH 8.4); clear smooth boundary.
B3—24 to 41 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure; hard, firm, sticky and plastic; few fine roots; few fine pores; strongly calcareous; calcium carbonate in veins and as coatings on peds; strongly alkaline (pH 8.6); abrupt smooth boundary.
R—41 inches; shale.

Paralithic contact is at a depth of 40 to 60 inches. Clay content is 28 to 35 percent. Hue is 10YR or 2.5Y.

Mellenthin Series

The Mellenthin series consists of shallow, well drained, moderately permeable soils on ridges, mesas, and hillsides. These soils formed in residuum derived from sandstone. Slopes are 4 to 30 percent. Elevation is 5,800 to 6,500 feet. Average annual precipitation is 8 to 12 inches, and average annual air temperature is 45 to 50 degrees F.

These soils are loamy-skeletal, mixed, mesic Lithic Ustollic Calciorthids.

Typical pedon of a Mellenthin gravelly fine sandy loam, 4 to 15 percent slopes, in an area of Begay-Mellenthin complex, about 33 miles southeast of Hanksville, in the NE1/4 of sec. 12, T. 29 S., R. 16 E.

A1—0 to 3 inches; yellowish red (5YR 5/6) gravelly fine sandy loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few fine roots; few very fine pores; 20 percent of surface is covered with pebbles; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.0); clear smooth boundary.
C1ca—3 to 10 inches; reddish brown (5YR 5/4) very channery fine sandy loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine and medium roots; few fine pores; 30 percent sandstone channery fragments and 10 percent flagstones; strongly calcareous; calcium carbonate is disseminated, coated on rock fragments, and in masses; moderately alkaline (pH 8.2); gradual wavy boundary.
C2ca—10 to 16 inches; light reddish brown (5YR 6/4) very channery fine sandy loam, reddish brown (5YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine and medium roots; few fine pores; 40 percent sandstone channery fragments; strongly calcareous; calcium carbonate is disseminated, coated on rock fragments, and in masses; moderately alkaline (pH 8.4); abrupt smooth boundary.
R—16 inches; sandstone.

Bedrock is at a depth of 10 to 20 inches.

A1 horizon: Rock fragment content is 15 to 30 percent. Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4.

C horizon: Texture is very channery fine sandy loam or very gravelly fine sandy loam. Clay content is 10 to 15 percent. Rock fragment content is 35 to 50 percent. Value is 5 to 7 when dry, and chroma is 4 to 6 when moist.

Mido Series

The Mido series consists of very deep, excessively drained, rapidly permeable soils on mesas and benches and in broad valleys. These soils formed in eolian deposits derived from sandstone. Slopes are 2 to 15 percent. Elevation is 4,800 to 6,400 feet. Average annual precipitation is 8 to 12 inches, and average annual air temperature is 45 to 52 degrees F.

These soils are mixed, mesic Ustic Torripsamments.

Typical pedon of Mido loamy fine sand, 4 to 15 percent slopes, about 18 miles northeast of Hanksville, about 1,500 feet east and 500 feet south of the northwest corner of sec. 4, T. 27 S., R. 14 E.

A1—0 to 2 inches; reddish brown (5YR 5/4) loamy fine sand, reddish brown (5YR 4/4) moist; single grain; loose; very few fine roots; common fine interstitial pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); abrupt smooth boundary.
C—2 to 60 inches; reddish brown (5YR 5/4) loamy fine sand, reddish brown (5YR 4/4) moist; single grain; loose; few fine and medium roots; few fine tubular pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4).

A1 and C horizons: Clay content is 3 to 8 percent. Value is 5 or 6 when dry and 4 or 5 when moist, and

chroma is 4 to 6. Reaction is moderately alkaline or strongly alkaline.

Milok Series

The Milok series consists of very deep, well drained, moderately rapidly permeable soils on benches, mesas, ridges, and fan terraces. These soils formed in alluvial and eolian material derived from sandstone. Slopes are 1 to 8 percent. Elevation is 4,900 to 6,000 feet. Average annual precipitation is 8 to 10 inches, and average annual air temperature is 47 to 50 degrees F.

These soils are coarse-loamy, mixed, mesic Ustollic Calciorthids.

Typical pedon of Milok loamy fine sand, 4 to 8 percent slopes, about 25 miles northwest of Hanksville, about 700 feet west and 1,500 feet south of the northeast corner of sec. 28, T. 27 S., R. 15 E.

A1—0 to 4 inches; yellowish red (5YR 5/6) loamy fine sand, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; soft, very friable; few fine and very fine roots; few fine interstitial pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.0); abrupt smooth boundary.

B2—4 to 12 inches; reddish yellow (5YR 6/6) loamy fine sand, yellowish red (5YR 5/6) moist; weak medium subangular blocky structure; slightly hard, very friable; common very fine and fine roots; few fine pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

C1ca—12 to 25 inches; light brown (7.5YR 6/4) fine sandy loam, strong brown (7.5YR 5/6) moist; massive; hard, very friable, slightly sticky and slightly plastic; common fine and few medium roots; few fine pores; strongly calcareous; calcium carbonate is disseminated and concentrated in masses; moderately alkaline (pH 8.2); clear wavy boundary.

C2ca—25 to 47 inches; light brown (7.5YR 6/4) fine sandy loam, strong brown (7.5YR 5/6) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; strongly calcareous; calcium carbonate is disseminated and in masses; moderately alkaline (pH 8.4); clear wavy boundary.

C3—47 to 60 inches; reddish yellow (7.5YR 6/6) gravelly loamy sand, strong brown (7.5YR 5/6) moist; massive; loose; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4).

Depth to calcic horizon is 10 to 20 inches. The profile has hue of 5YR or 7.5YR.

A1 horizon: Texture is loamy fine sand or sandy loam. Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 6.

B2 horizon: Texture is loamy fine sand or fine sandy loam. Clay content is 12 to 18 percent. Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 6.

C horizon: Gravelly loamy sand is below a depth of 40 inches in some pedons. Rock fragment content is 0 to 15 percent, but in some pedons it increases to 25 percent below a depth of 40 inches. Value is 5 to 8 when dry and 4 to 6 when moist, and chroma is 2 to 6. Reaction is moderately alkaline or strongly alkaline.

Mivida Series

The Mivida series consists of very deep, well drained, moderately rapidly permeable soils on fans. These soils formed in alluvial and eolian sediment derived from sandstone. Slopes are 0 to 4 percent. Elevation is 5,000 to 6,000 feet. Average annual precipitation is 8 to 10 inches, and average annual air temperature is 45 to 50 degrees F.

These soils are coarse-loamy, mixed, mesic Ustollic Calciorthids.

Typical pedon of a Mivida loamy fine sand, 0 to 4 percent slopes, in an area of Mivida-Goblin complex, about 12 miles northwest of Caineville, in the NE1/4 of sec. 11, T. 27 S., R. 6 E.

A1—0 to 6 inches; yellowish red (5YR 5/6) loamy fine sand, yellowish red (5YR 4/6) moist; weak fine granular structure; soft, very friable, slightly sticky; few fine roots; few fine interstitial pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

B2—6 to 22 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores; slightly calcareous; disseminated calcium carbonate (pH 8.2); clear smooth boundary.

C1ca—22 to 42 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; massive; hard, friable, slightly sticky; few fine roots; few fine tubular pores; strongly calcareous; calcium carbonate is in veins and soft masses and is disseminated; strongly alkaline (pH 8.6); clear smooth boundary.

C2ca—42 to 60 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; massive; hard, very friable; few fine roots; common fine interstitial pores; moderately calcareous; calcium carbonate is in veins and is disseminated; strongly alkaline (pH 8.6).

Gypsum crystals are below a depth of 40 inches in some pedons. Clay content is 10 to 18 percent.

Mivida Variant

The Mivida Variant consists of deep, well drained, moderately permeable soils on steep breaks below mesa rims. These soils formed in colluvium derived from sandstone, shale, and igneous rock. Slopes are 15 to 40 percent. Elevation is 5,000 to 6,000 feet. Average annual precipitation is 8 to 10 inches, and average annual air temperature is 48 to 50 degrees F.

These soils are coarse-loamy, mixed, mesic Ustollic Calciorthids.

Typical pedon of Mivida Variant very cobbly very fine sandy loam, 15 to 40 percent slopes, about 4 miles northwest of King Ranch, about 1,500 feet east and 1,500 feet south of the northwest corner of sec. 18, T. 31 S., R. 9 E.

A1—0 to 8 inches; brown (7.5YR 5/4) very cobbly very fine sandy loam, brown (7.5YR 4/4) moist; weak fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; few fine and medium roots; few very fine and fine pores; 30 percent cobbles and 30 percent pebbles; moderately calcareous; disseminated calcium carbonate; strongly alkaline (pH 9.0); gradual smooth boundary.

B2—8 to 15 inches; light yellowish brown (10YR 6/4) very fine sandy loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few fine roots; common very fine and few fine pores; moderately calcareous; disseminated calcium carbonate; strongly alkaline (pH 8.9); gradual smooth boundary.

C1ca—15 to 30 inches; very pale brown (10YR 7/3) fine sandy loam, light yellowish brown (2.5Y 6/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few fine roots; few very fine and fine pores; strongly calcareous; disseminated calcium carbonate; very strongly alkaline (pH 9.1); gradual smooth boundary.

C2—30 to 48 inches; very pale brown (10YR 7/3) fine sandy loam, light yellowish brown (2.5Y 6/4) moist; massive; soft, very friable; few fine roots; strongly calcareous; disseminated calcium carbonate; very strongly alkaline (pH 9.4); abrupt smooth boundary.

C3r—48 inches; weathered shale.

Paralithic contact is at a depth of 40 to 60 inches. Clay content is 10 to 18 percent.

Moenkopie Series

The Moenkopie series consists of shallow, well drained, moderately rapidly permeable soils on benches, mesas, and old pediment surfaces. These soils formed in residuum and alluvium derived from sandstone. Slopes are 2 to 50 percent. Elevation is 3,600 to 5,100 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 50 to 53 degrees F.

These soils are loamy, mixed (calcareous), mesic Lithic Torriorthents.

Typical pedon of a Moenkopie fine sandy loam, 4 to 15 percent slopes, in an area of Moenkopie-Chipeta complex, about 21 miles northeast of Factory Butte, about 500 feet west and 1,300 feet south of the northeast corner of sec. 24, T. 27 S., R. 9 E.

A1—0 to 3 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/4) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores; moderately calcareous; disseminated calcium carbonate; strongly alkaline (pH 8.6); clear smooth boundary.

C1—3 to 17 inches; light reddish brown (5YR 6/4) fine sandy loam, reddish brown (5YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores; moderately calcareous; disseminated calcium carbonate; strongly alkaline (pH 8.6); abrupt smooth boundary.

R—17 inches; sandstone.

Bedrock is at a depth of 5 to 20 inches.

A1 horizon: Texture is fine sandy loam or channery sandy loam. Rock fragment content is 0 to 35 percent. Hue is 7.5YR or 5YR, value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 6. Reaction is moderately alkaline or strongly alkaline.

C horizon: Texture is fine sandy loam or sandy loam. Clay content is 12 to 18 percent. Rock fragment content is 0 to 35 percent. Hue is 5YR or 2.5YR, value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 or 6. Reaction is moderately alkaline or strongly alkaline.

Moffat Series

The Moffat series consists of very deep, well drained, moderately rapidly permeable soils on upland benches and alluvial fans and in valleys. These soils formed in alluvial and eolian material derived from sandstone. Slopes are 2 to 15 percent. Elevation is 3,800 to 5,100 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 50 to 53 degrees F.

These soils are coarse-loamy, mixed, mesic Typic Calciorthids.

Typical pedon of a Moffat loamy fine sand, 2 to 8 percent slopes, in an area of Moffat-Sheppard complex, about 36 miles northeast of Hanksville, about 1,200 feet west and 1,300 feet south of the northeast corner of sec. 18, T. 27 S., R. 17 E.

A1—0 to 2 inches; light reddish brown (5YR 6/4) loamy fine sand, reddish brown (5YR 5/4) moist; single

grain; loose; few fine roots; few fine interstitial pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

B2—2 to 14 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

C1ca—14 to 30 inches; pinkish white (5YR 8/2) fine sandy loam, pinkish gray (5YR 7/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few fine roots; few fine tubular pores; strongly calcareous; segregated calcium carbonate; moderately alkaline (pH 8.4); clear smooth boundary.

C2ca—30 to 45 inches; pink (5YR 7/4) fine sandy loam, light reddish brown (5YR 6/4) moist; massive; hard, firm, slightly sticky and plastic; few fine tubular pores; strongly calcareous; segregated calcium carbonate; strongly alkaline (pH 8.6); gradual wavy boundary.

C3—45 to 60 inches; light reddish brown (5YR 6/4) fine sandy loam, reddish brown (5YR 5/4) moist; massive; slightly hard, very friable, slightly sticky; few fine tubular pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4).

The calcic horizon is at a depth of 8 to 15 inches. Hue is 5YR or 7.5YR.

A1 horizon: Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 6.

B2 horizon: Clay content is 12 to 18 percent. Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 3 to 6. Reaction is moderately alkaline or strongly alkaline.

C horizon: Clay content is 12 to 18 percent. Value is 6 to 8 when dry and 5 to 7 when moist, and chroma is 2 to 4. Reaction is moderately alkaline or strongly alkaline.

Montosa Family

The Montosa family consists of very deep, well drained, moderately permeable soils on alluvial fans, benches, and mountainsides. These soils formed in alluvium and colluvium derived from diorite and sandstone. Slopes are 4 to 50 percent. Elevation is 6,500 to 8,000 feet. Average annual precipitation is 12 to 16 inches, and average annual air temperature is 45 to 50 degrees F.

These soils are loamy-skeletal, mixed, mesic Aridic Argiustolls.

Reference pedon of Montosa family, 4 to 8 percent slopes, about 20 miles south of Hanksville, in the SE1/4 of sec. 19, T. 31 S., R. 11 E.

A1—0 to 3 inches; brown (7.5YR 5/2) cobbly very fine sandy loam, dark brown (10YR 3/3) moist; weak medium platy structure; soft, very friable, slightly sticky and slightly plastic; many fine and few medium roots; common very fine and fine pores; 15 percent pebbles and cobbles; moderately alkaline (pH 8.2); clear wavy boundary.

B2t—3 to 11 inches; brown (7.5YR 4/4) very cobbly loam, dark brown (7.5YR 3/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many fine and few medium roots; few very fine and fine pores; 35 to 40 percent pebbles and cobbles; moderately alkaline (pH 8.2); clear wavy boundary.

C1ca—11 to 32 inches; brown (10YR 5/3) very cobbly coarse sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and few medium roots; common very fine and fine pores; 50 to 60 percent pebbles and cobbles; very strongly calcareous; calcium carbonate is segregated and on pebble faces; moderately alkaline (pH 8.4); clear smooth boundary.

C2ca—32 to 46 inches; brown (10YR 5/3) very cobbly coarse sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; common very fine and fine pores; 50 to 60 percent pebbles and cobbles; very strongly calcareous; segregated calcium carbonate; strongly alkaline (pH 8.6); clear wavy boundary.

C3ca—46 to 52 inches; pale brown (10YR 6/3) very cobbly coarse sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable; very few fine roots; common very fine and fine pores; 50 to 60 percent pebbles and cobbles; very strongly calcareous; segregated calcium carbonate; strongly alkaline (pH 8.6); clear wavy boundary.

C4—52 to 60 inches; pale brown (10YR 6/3) extremely cobbly loamy coarse sand, dark grayish brown (10YR 4/2) moist; massive; soft, very friable; 65 percent pebbles and cobbles; strongly calcareous; moderately alkaline (pH 8.4).

The particle size control section is 35 to 50 percent rock fragments.

C horizon: Texture is very cobbly coarse sandy loam or extremely cobbly loamy coarse sand. Clay content is 5 to 20 percent. Rock fragment content is 40 to 70 percent. Hue is 5YR to 10YR, value is 4 to 6 when dry and 4 or 5 when moist, and chroma is 2 to 4. Reaction is moderately alkaline or strongly alkaline.

Monue Series

The Monue series consists of very deep, well drained, moderately rapidly permeable soils on alluvial terraces

and upland plains. These soils formed in alluvium derived from sandstone. Slopes are 2 to 4 percent. Elevation is 3,800 to 5,000 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 50 to 53 degrees F.

These soils are coarse-loamy, mixed, mesic Typic Camborthids.

Typical pedon of Monue loamy fine sand, about 8 miles northeast of Hanksville, about 1,700 feet west and 1,400 feet north of the southeast corner of sec. 2, T. 27 S., R. 12 E.

A1—0 to 3 inches; light reddish brown (5YR 6/4) loamy fine sand, reddish brown (5YR 5/4) moist; single grain; loose; few fine roots; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

B2—3 to 11 inches; light reddish brown (5YR 6/4) fine sandy loam, reddish brown (5YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly plastic; few fine roots; few fine tubular pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

C1—11 to 30 inches; light reddish brown (5YR 6/4) fine sandy loam, reddish brown (5YR 5/4) moist; massive; slightly hard, very friable; very few fine roots; few fine tubular pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear wavy boundary.

C2—30 to 60 inches; light reddish brown (5YR 6/4) fine sandy loam, reddish brown (5YR 5/4) moist; massive; loose; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2).

Clay content is 12 to 17 percent. The profile has hue of 5YR or 2.5YR, value of 5 or 6 when dry and 4 or 5 when moist, and chroma of 4 to 6.

Monue Variant

The Monue Variant consists of moderately deep, well drained, moderately permeable soils on mesas and benches. These soils formed in alluvium and residuum derived from sandstone. Slopes are 2 to 4 percent. Elevation is 4,800 to 4,900 feet. Average annual precipitation is 6 to 8 inches, and average annual air temperature is 50 to 52 degrees F.

These soils are coarse-loamy, mixed, mesic Typic Haplargids.

Typical pedon of a Monue Variant fine sandy loam, 2 to 4 percent slopes, in an area of Monue Variant-Farb-Rock outcrop complex, about 10 miles southwest of Hanksville, about 500 feet north and 2,500 feet west of the southeast corner of sec. 21, T. 29 S., R. 10 E.

A1—0 to 8 inches; light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; single grain; slightly hard, friable; few very fine and fine roots; common interstitial pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear wavy boundary.

B2t—8 to 24 inches; light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; weak subangular blocky structure; slightly hard, very friable; few fine and very fine roots; few fine interstitial pores; few patchy clay films; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear wavy boundary.

C1ca—24 to 39 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few fine roots; few fine interstitial pores; strongly calcareous; veins and splotches of calcium carbonate; moderately alkaline (pH 8.2).

R—39 inches; sandstone.

Bedrock is at a depth of 20 to 40 inches.

Cca horizon: Clay content is 15 to 18 percent. Value is 6 or 7 when dry and 4 or 5 when moist, and chroma is 3 or 4.

Myton Family

The Myton family consists of very deep, well drained, moderately rapidly permeable soils on stream terraces, mountainsides, and colluvial hillsides. These soils formed in alluvium and colluvium derived from sandstone and shale. Slopes are 2 to 70 percent. Elevation is 3,800 to 6,500 feet. Average annual precipitation is 5 to 10 inches, and average annual air temperature is 49 to 53 degrees F.

These soils are loamy-skeletal, mixed (calcareous), mesic Typic Torriorthents.

Typical pedon of a Myton family very gravelly sandy loam, 2 to 15 percent slopes, in an area of Green River-Myton families complex, about 53 miles southwest of Hanksville, in the NW1/4 of sec. 32, T. 36 S., R. 9 E.

A1—0 to 6 inches; reddish brown (2.5YR 5/4) very gravelly sandy loam, reddish brown (2.5YR 4/4) moist; single grain; loose; few fine roots; few fine interstitial pores; 50 percent pebbles and cobbles; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

C1ca—6 to 30 inches; pinkish white (5YR 8/2) very cobbly sandy loam, pinkish gray (5YR 7/2) moist; massive; hard, firm, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores; 60 percent pebbles and cobbles; strongly calcareous; segregated calcium carbonate; strongly alkaline (pH 8.6); clear wavy boundary.

C2ca—30 to 60 inches; light reddish brown (2.5YR 6/4) very cobbly sandy loam, reddish brown (2.5YR 5/4) moist; massive; slightly hard, friable; few fine and medium roots; few fine interstitial pores; 60 percent cobbles; strongly calcareous; segregated calcium carbonate; moderately alkaline (pH 8.4).

Clay content is 10 to 18 percent.

Neskahi Family

The Neskahi family consists of very deep, well drained, moderately permeable soils on flood plains. These soils formed in alluvium derived dominantly from sandstone and shale. Slopes are 0 to 4 percent. Elevation is 4,000 to 5,000 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 50 to 52 degrees F.

These soils are coarse-loamy, mixed (calcareous), mesic Typic Torrifluvents.

Reference pedon of a Neskahi family fine sandy loam, 0 to 4 percent slopes, in an area of Riverwash-Neskahi family complex, about 22 miles southeast of Hanksville, in the NW1/4NE1/4 of sec. 24, T. 29 S., R. 14 E.

A1—0 to 4 inches; light reddish brown (2.5YR 6/4) fine sandy loam, reddish brown (2.5YR 5/4) moist; weak fine granular structure; soft, very friable; few fine and medium roots; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); clear smooth boundary.

C1—4 to 13 inches; light reddish brown (2.5YR 6/4) very fine sandy loam, reddish brown (2.5YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few medium and coarse roots; few fine pores; strongly calcareous; disseminated calcium carbonate; very strongly alkaline (pH 9.4); clear smooth boundary.

C2—13 to 60 inches; light reddish brown (2.5YR 6/4) stratified fine sandy loam and silt loam, reddish brown (2.5YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few medium and coarse roots; few fine and medium pores; strongly calcareous; disseminated calcium carbonate; strongly alkaline (pH 8.6).

Texture of the profile ranges from sand to clay but commonly is sandy loam to loam that is 10 to 18 percent clay. Hue is 2.5YR to 5Y, value is 5 to 7 when dry and 4 to 6 when moist, and chroma is 4 to 8.

Olnes Family

The Olnes family consists of deep, well drained, moderately permeable soils on mountainsides. These soils formed in colluvium derived from diorite. Slopes are 50 to 70 percent. Elevation is 9,500 to 11,500 feet. Average annual precipitation is 22 to 30 inches, and average annual air temperature is 33 to 38 degrees F.

These soils are loamy-skeletal, mixed, nonacid Typic Cryorthents.

Reference pedon of Olnes family, 50 to 70 percent slopes, about 22 miles south of Hanksville, in the Henry Mountains, in the NE1/4 of sec. 35, T. 31 S., R. 10 E.

O1—4 inches to 0; partially decomposed needles and twigs.

A1—0 to 6 inches; brown (7.5YR 5/4) cobbly loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and plastic; many fine and medium roots; many fine and medium pores; 20 percent pebbles and cobbles; slightly acid (pH 6.2); clear wavy boundary.

C1—6 to 36 inches; pink (7.5YR 7/4) very cobbly loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and plastic; common fine and medium roots; common fine and medium pores; 45 percent pebbles and cobbles; medium acid (pH 6.0); abrupt wavy boundary.

C2—36 to 59 inches; pink (7.5YR 7/4) extremely cobbly loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and plastic; few fine roots; few fine pores; 80 percent cobbles; medium acid (pH 6.0); gradual wavy boundary.

R—59 inches; diorite.

Bedrock is at a depth of 40 to 60 inches.

A1 horizon: Hue is 5YR to 10YR, value is 5 or 6 when dry, and chroma is 3 or 4.

C horizon: Texture is very cobbly loam, very gravelly loam, or extremely cobbly loam. Clay content is 10 to 20 percent. Hue is 7.5YR or 10YR, value is 6 or 7 when dry, and chroma is 3 or 4.

Otero Family

The Otero family consists of very deep, well drained, moderately rapidly permeable soils on terrace side slopes. These soils formed in alluvium derived from sandstone and shale. Slopes are 2 to 4 percent. Elevation is 4,600 to 6,000 feet. Average annual precipitation is 6 to 10 inches, and average annual air temperature is 48 to 52 degrees F.

These soils are coarse-loamy, mixed (calcareous), mesic Ustic Torriorthents.

Typical pedon of an Otero family fine sandy loam, 2 to 4 percent slopes, in an area of Otero-Glenberg families complex, about 9 miles east of Hanksville, in the NW1/4NW1/4 of sec. 20, T. 28 S., R. 13 E.

A1—0 to 5 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; single grain; soft, very friable; few fine roots; moderately

calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); gradual wavy boundary.

C1—5 to 24 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly plastic; few fine and medium roots; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); gradual wavy boundary.

C2—24 to 60 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; massive; slightly hard, very friable, slightly plastic; few fine and medium roots; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4).

Texture of the profile is variable, but most commonly it is fine sandy loam that is 10 to 18 percent clay. Hue is 2.5YR to 10YR, value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 8.

Palma Series

The Palma series consists of very deep, well drained, moderately rapidly permeable soils on mesas. These soils formed in alluvium and residuum derived from sandstone. Slopes are 2 to 4 percent. Elevation is 5,600 to 6,800 feet. Average annual precipitation is 10 to 12 inches, and average annual air temperature is 47 to 50 degrees F.

These soils are coarse-loamy, mixed, mesic Ustollic Haplargids.

Typical pedon of Palma very fine sandy loam, about 8 miles southwest of King Ranch, about 200 feet south and 100 feet west of the northeast corner of sec. 11, T. 33 S., R. 8 E.

A1—0 to 5 inches; brown (7.5YR 5/4) very fine sandy loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure and weak fine granular; soft, very friable; common fine and few medium roots; common very fine and few fine pores; mildly alkaline (pH 7.7); clear smooth boundary.

B21t—5 to 13 inches; strong brown (7.5YR 5/6) very fine sandy loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky; common fine roots and few medium and coarse roots; few very fine and fine pores; few thin clay films in pores; mildly alkaline (pH 7.5); gradual wavy boundary.

B22t—13 to 21 inches; strong brown (7.5YR 5/6) very fine sandy loam, reddish brown (5YR 4/4) moist; weak coarse subangular blocky structure; slightly hard, very friable, slightly sticky; few fine and coarse roots; few fine and medium pores; few thin clay films in pores; mildly alkaline (pH 7.6); gradual wavy boundary.

B23t—21 to 28 inches; brown (7.5YR 5/4) very fine sandy loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable; few fine roots; few very fine and fine pores; few thin clay films in pores; slightly calcareous; disseminated calcium carbonate; strongly alkaline (pH 8.5); gradual wavy boundary.

B3—28 to 36 inches; brown (7.5YR 5/4) very fine sandy loam, brown (7.5YR 4/4) moist; weak coarse angular blocky structure; slightly hard, very friable; few fine roots; few very fine and fine pores; slightly calcareous; disseminated calcium carbonate; strongly alkaline (pH 8.6); gradual wavy boundary.

C1ca—36 to 54 inches; light brown (7.5YR 6/4) very fine sandy loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable; few fine pores; moderately calcareous; disseminated calcium carbonate; strongly alkaline (pH 8.8); clear smooth boundary.

C2ca—54 to 60 inches; light brown (7.5YR 6/4) very fine sandy loam, brown (7.5YR 4/4) moist; massive; slightly hard, very friable; moderately calcareous; disseminated calcium carbonate; strongly alkaline (pH 9.0).

B horizon: Reaction is mildly alkaline or moderately alkaline. The particle size control section ranges from sandy loam to very fine sandy loam and is 15 to 30 percent sand that is fine or coarser. Clay content is 12 to 18 percent.

A1 and B horizons: Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4.

C horizon: Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 6.

Pando Family

The Pando family consists of deep, well drained, moderately permeable soils on mountainsides. These soils formed in colluvium derived from diorite and shale. Slopes are 50 to 70 percent. Elevation is 8,400 to 11,500 feet. Average annual precipitation is 20 to 30 inches, and average annual air temperature is 32 to 38 degrees F.

These soils are loamy-skeletal, mixed Boralfic Cryoborolls.

Reference pedon of a Pando family cobbly loam, 50 to 70 percent slopes, in an area of Olnes-Pando families complex, about 23 miles south of Hanksville, in the Henry Mountains, in the NW1/4 of sec. 23, T. 31 S., R. 10 E.

O1—2 inches to 0; twigs and litter.

A1—0 to 10 inches; brown (10YR 4/3) cobbly loam, very dark grayish brown (10YR 3/2) moist; weak moderate and coarse subangular blocky structure; soft, very friable; slightly sticky and plastic; many

fine roots and common medium and coarse roots; many fine pores and common medium and coarse pores; 25 percent cobbles and pebbles; neutral (pH 7.2); clear wavy boundary.

A2—10 to 25 inches; light brownish gray (10YR 6/2) very cobbly loam, dark grayish brown (10YR 4/2) moist; weak moderate subangular blocky structure; soft, friable, slightly sticky and plastic; many fine roots, few medium roots, and common coarse roots; many fine pores, few medium pores, and common coarse pores; 40 percent cobbles and pebbles; slightly alkaline (pH 7.4); abrupt wavy boundary.

B2t—25 to 55 inches; yellowish brown (10YR 5/4) very cobbly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; moderately thick continuous clay films; 55 percent cobbles and pebbles; neutral (pH 7.2); abrupt wavy boundary.

Cr—55 to 60 inches; unweathered shale.

Paralithic contact is at a depth of 40 to 60 inches.

A1 horizon: Rock fragment content is 15 to 35 percent.

A2 horizon: Rock fragment content is 35 to 50 percent. Value is 6 when dry and 4 or 5 when moist. Reaction is neutral or mildly alkaline.

B2t horizon: Texture is very cobbly loam or very cobbly clay loam. Clay content is 18 to 35 percent. Rock fragment content is 50 to 60 percent. Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 2 to 4. Reaction is neutral or mildly alkaline.

Pastern Series

The Pastern series consists of shallow, well drained, moderately permeable soils on alluvial fans, benches, mesas, and fan terraces. These soils formed in alluvium derived from sandstone. Slopes are 2 to 15 percent. Elevation is 4,700 to 6,200 feet. Average annual precipitation is 8 to 11 inches, and average annual air temperature is 47 to 50 degrees F.

These soils are loamy, mixed, mesic, shallow Ustollic Paleorthids.

Typical pedon of Pastern cobbly fine sandy loam, 2 to 15 percent slopes, about 45 miles south of Hanksville, about 3,200 feet south and 600 feet east of the northwest corner of sec. 15, T. 35 S., R. 12 E.

A1—0 to 4 inches; yellowish red (5YR 5/6) cobbly fine sandy loam, yellowish red (5YR 4/6) moist; single grain; soft, very friable, slightly sticky and slightly plastic; few very fine roots; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

C1ca—4 to 9 inches; light reddish brown (5YR 6/4) gravelly loam, yellowish red (5YR 5/6) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few fine and very fine roots; few very fine pores; 30 percent pebbles; very strongly calcareous; calcium carbonate is disseminated and in hardpan fragments; moderately alkaline (pH 8.2); gradual wavy boundary.

C2ca—9 to 15 inches; pink (5YR 7/3) gravelly loam, light reddish brown (5YR 6/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine roots; 35 percent pebble-sized hardpan fragments; very strongly calcareous; disseminated calcium carbonate; strongly alkaline (pH 8.6); clear smooth boundary.

C3cam—15 inches; indurated calcium-carbonate-cemented hardpan.

The hardpan is at a depth of 10 to 20 inches.

A1 horizon: Texture is cobbly fine sandy loam or fine sandy loam. Rock fragment content is 0 to 35 percent. Value is 4 or 5 when dry and 3 or 4 when moist, and chroma is 4 to 6.

C horizon: Texture is gravelly loam or fine sandy loam. Clay content is 5 to 27 percent. Value is 6 or 7 when dry and 5 or 6 when moist, and chroma is 3 to 6. Reaction is moderately alkaline or strongly alkaline.

Pennell Series

The Pennell series consists of shallow, well drained, moderately permeable soils on mesas, benches, uplands, and hillsides. These soils formed in residuum and colluvium derived from sandstone and siltstone. Slopes are 2 to 50 percent. Elevation is 4,500 to 5,200 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 50 to 52 degrees F.

These soils are loamy, mixed, mesic Lithic Calciorthids.

Typical pedon of a Pennell fine sandy loam, 2 to 8 percent slopes, in an area of Pennell-Moenkopie-Rock outcrop, complex 2 to 15 percent slopes, about 20 miles southeast of Hanksville, about 1,500 feet west and 1,000 feet south of the northeast corner of sec. 18, T. 30 S., R. 14 E.

A1—0 to 3 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

AC—3 to 8 inches; reddish yellow (5YR 6/6) fine sandy loam, yellowish red (5YR 5/6) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few fine pores; 10 percent fine pebbles; strongly calcareous; disseminated calcium carbonate;

moderately alkaline (pH 8.2); gradual wavy boundary.

C1ca—8 to 15 inches; pink (5YR 7/4) channery loam, reddish brown (5YR 5/4) moist; massive; hard, friable, slightly sticky and plastic; few very fine roots; 20 percent channery fragments; very strongly calcareous; calcium carbonate is disseminated and in soft masses; moderately alkaline (pH 8.4); clear smooth boundary.

R—15 inches; sandstone.

Bedrock is at a depth of 10 to 20 inches. The calcic horizon is at a depth of 4 to 9 inches. The profile has hue of 5YR or 7.5YR.

A1 horizon: Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 3 to 6.

C horizon: Texture is fine sandy loam, sandy loam, loam, gravelly sandy loam, channery loam, or channery sandy loam. Clay content is 10 to 25 percent. Rock fragment content is 0 to 25 percent. Value is 5 to 8 when dry and 4 to 7 when moist, and chroma is 4 to 6.

Redcreek Series

The Redcreek series consists of shallow, well drained, moderately rapidly permeable soils on mesas. These soils formed in residuum derived from sandstone. Slopes are 2 to 8 percent. Elevation is 6,000 to 7,000 feet. Average annual precipitation is 10 to 13 inches, and average annual air temperature is 40 to 45 degrees F.

These soils are loamy, mixed (calcareous), frigid Lithic Ustic Torriorthents.

Typical pedon of a Redcreek fine sandy loam, 2 to 8 percent slopes, in an area of Redcreek-Windwhistle Variant complex, about 33 miles southwest of Hanksville, in the SW1/4 of sec. 33, T. 32 S., R. 9 E.

A1—0 to 5 inches; reddish brown (5YR 5/3) fine sandy loam, reddish brown (5YR 4/3) moist; weak coarse prismatic structure; slightly hard, friable, slightly sticky and plastic; moderately alkaline (pH 8.2); clear wavy boundary.

C—5 to 14 inches; reddish brown (5YR 5/4) fine sandy loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and plastic; slightly calcareous; few fine masses of calcium carbonate; moderately alkaline (pH 8.2); abrupt wavy boundary.

R—14 inches; sandstone.

Bedrock is at a depth of 10 to 20 inches. Clay content is 12 to 18 percent.

Rizno Series

The Rizno series consists of shallow, well drained, moderately rapidly permeable soils on mesas, benches, hillsides, and ridges. These soils formed in residual and eolian material derived from sandstone. Slopes are 4 to 30 percent. Elevation is 5,000 to 6,400 feet. Average annual precipitation is 8 to 12 inches, and average annual air temperature is 45 to 50 degrees F.

These soils are loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents.

Typical pedon of a Rizno fine sandy loam, 4 to 15 percent slopes, in an area of Rizno-Mido complex, about 26 miles southeast of Hanksville, in the SW1/4 of sec. 26, T. 30 S., R. 14 E.

A1—0 to 4 inches; yellowish red (5YR 5/6) fine sandy loam, red (2.5YR 5/6) moist; single grain; loose; few fine roots; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.0); clear smooth boundary.

C1—4 to 10 inches; yellowish red (5YR 5/6) fine sandy loam, red (2.5YR 5/6) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; few fine pores; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); gradual smooth boundary.

C2—10 to 18 inches; light reddish brown (5YR 6/4) channery loam, reddish brown (5YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine pores; strongly calcareous; calcium carbonate is disseminated and in soft masses; moderately alkaline (pH 8.4); gradual wavy boundary.

R—18 inches; sandstone.

Bedrock is at a depth of 7 to 20 inches.

A1 horizon: Texture is fine sandy loam or channery fine sandy loam. Rock fragment content is 0 to 30 percent. Hue is 5YR or 2.5YR, value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 6.

C horizon: Texture is fine sandy loam, channery fine sandy loam, channery loam, or gravelly fine sandy loam. Clay content is 5 to 18 percent. Rock fragment content is 0 to 35 percent. Hue is 5YR or 2.5YR, value is 5 or 6 when dry or moist, and chroma is 4 to 6. Reaction is moderately alkaline or strongly alkaline.

Robroost Series

The Robroost series consists of very deep, well drained, moderately permeable soils on alluvial fans and valley plains. These soils formed in alluvium derived from gypsiferous shale and sandstone. Slopes are 2 to 15 percent. Elevation is 4,500 to 4,800 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 50 to 52 degrees F.

These soils are coarse-loamy, mixed, mesic Cambic Gypsiorthids.

Typical pedon of a Robroost fine sandy loam, 2 to 4 percent slopes, in an area of Robroost-Goblin complex,

eroded, about 38 miles south of Hanksville, in the NE1/4 of sec. 34, T. 28 S., R. 1 E.

A1—0 to 5 inches; light reddish brown (5YR 6/3) fine sandy loam, reddish brown (5YR 4/4) moist; weak thin platy structure; soft, very friable; few fine roots; very few fine pores; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear wavy boundary.
B2cs—5 to 10 inches; light reddish brown (5YR 6/3) loam, reddish brown (5YR 5/3) moist; weak coarse prismatic structure parting to weak subangular blocky; slightly hard, very friable, slightly plastic; few fine roots and very few medium roots; few fine pores; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear wavy boundary.
C1cs—10 to 30 inches; light reddish brown (5YR 6/3) loam, reddish brown (5YR 5/3) moist; weak coarse prismatic structure; hard, very friable, slightly plastic; few fine roots and very few medium roots; few fine pores; many medium and large veins and splotches of gypsum; strongly calcareous; calcium carbonate is disseminated and in veins; moderately alkaline (pH 8.2); gradual wavy boundary.
C2cs—30 to 60 inches; light reddish brown (5YR 6/3) loam, reddish brown (5YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; very few medium and fine roots; few fine pores; many veins and splotches of gypsum; strongly calcareous; veins and fine splotches of calcium carbonate; moderately alkaline (pH 8.2).

The profile has hue of 5YR or 7.5YR.

A1 horizon: Value is 5 or 6 when dry, and chroma is 3 or 4. Reaction is moderately alkaline or strongly alkaline.

B2 horizon: Texture is loam or fine sandy loam. Clay content is 10 to 18 percent. Reacticn is moderately alkaline or strongly alkaline.

Ccs horizon: Texture is sandy loam, fine sandy loam, or loam. Clay content is 10 to 18 percent. Value is 6 to 8 when dry, and chroma is 3 or 4. Reaction is moderately alkaline or strongly alkaline.

Rogert Series

The Rogert series consists of shallow, well drained, moderately rapidly permeable soils mountainsides. These soils formed in colluvium and residuum derived from diorite. Slopes are 50 to 70 percent. Elevation is 8,400 to 11,500 feet. Average annual precipitation is 22 to 30 inches, and average annual air temperature is 32 to 35 degrees F.

These soils are loamy-skeletal, mixed Lithic Cryoborolls.

Typical pedon of a Rogert very gravelly loam, 50 to 70 percent slopes, in an area of Rogert-Rogert Variant complex, about 22 miles south of Hanksville, in the Henry Mountains, in the SE1/4 of sec. 33, T. 31 S., R. 10 E.

A1—0 to 9 inches; dark grayish brown (10YR 4/2) very gravelly loam, dark brown (10YR 3/3) moist; weak moderate subangular blocky structure; soft, very friable, slightly sticky and plastic; common fine roots; common fine pores; about 40 percent pebbles; neutral (pH 6.8); clear wavy boundary.
C1—9 to 18 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; massive; soft, very friable, slightly sticky and plastic; few fine roots; few fine pores; about 50 percent pebbles; neutral (pH 7.0); abrupt wavy boundary.
R—18 inches; fractured diorite.

Bedrock is at a depth of 10 to 20 inches.

A1 horizon: Value is 4 or 5 when dry and 3 when moist, and chroma is 2 or 3.

C horizon: Clay content is 12 to 18 percent. Value is 4 to 6 when dry and 3 or 4 when moist, and chroma is 2 or 3.

Rogert Variant

The Rogert Variant consists of shallow, well drained, moderately permeable soils on mountainsides. These soils formed in colluvium and residuum derived from shale. Slopes are 50 to 70 percent. Elevation is 9,500 to 11,500 feet. Average annual precipitation is 20 to 30 inches, and average annual air temperature is 32 to 38 degrees F.

These soils are loamy-skeletal, mixed, shallow Typic Cryoborolls.

Typical pedon of a Rogert Variant loam, 50 to 70 percent slopes, in an area of Rogert-Rogert Variant complex, about 21 miles south of Hanksville, in the Henry Mountains, in the NE1/4 of sec. 26, T. 31 S., R. 10 E.

A11—0 to 3 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and plastic; common fine roots; common fine pores; about 10 percent shaly pebbles; neutral (pH 6.8); clear wavy boundary.
A12—3 to 8 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; common fine pores; 10 percent shaly pebbles; neutral (pH 7.0); clear wavy boundary.
C1—8 to 19 inches; light grayish brown (10YR 6/2) very shaly loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and plastic; few fine roots; few fine pores; 55 percent

shale fragments; mildly alkaline (pH 7.6); abrupt wavy boundary.
C2r—19 inches, weathered shale.

Paralithic contact is at a depth of 10 to 20 inches. Clay content is 18 to 27 percent.

Shedado Series

The Shedado series consists of moderately deep, well drained, moderately rapidly permeable soils on alluvial fans and hillsides. These soils formed in eolian and alluvial material derived from sandstone. Slopes are 4 to 15 percent. Elevation is 5,200 to 6,200 feet. Average annual precipitation is 8 to 10 inches, and average annual air temperature is 47 to 50 degrees F.

These soils are coarse-loamy, mixed (calcareous), mesic Ustic Torriorthents.

Typical pedon of a Shedado fine sandy loam, 4 to 15 percent slopes, in an area of Shedado complex, about 22 miles southwest of Hanksville, in the SW1/4 of sec. 18, T. 31 S., R. 8 E.

A1—0 to 3 inches; light reddish brown (5YR 6/3) fine sandy loam, reddish brown (5YR 5/3) moist; massive; soft, very friable; common very fine, fine, and medium roots; common fine pores; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.
C1—3 to 12 inches; light reddish brown (5YR 6/3) fine sandy loam, reddish brown (5YR 5/3) moist; massive; soft, very friable; few very fine roots and common fine and medium roots; common fine pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.
C2—12 to 22 inches; light reddish brown (5YR 6/3) fine sandy loam, reddish brown (5YR 5/3) moist; massive; soft, very friable; few fine and medium roots; common fine pores; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); abrupt smooth boundary.
R—22 inches; sandstone.

Bedrock is at a depth of 20 to 40 inches. Clay content is 12 to 18 percent.

Sheppard Series

The Sheppard series consists of very deep, somewhat excessively drained, rapidly permeable soils on upland benches, alluvial fans, and hillsides and in valleys. These soils formed in eolian and alluvial material derived dominantly from sandstone. Slopes are 2 to 15 percent. Elevation is 4,000 to 5,700 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 50 to 53 degrees F.

These soils are mixed, mesic Typic Torripsamments.

Typical pedon of Sheppard loamy fine sand, 2 to 8 percent slopes, about 5 miles northwest of Hanksville, in the SW1/4SW1/4 of sec. 29, T. 27 S., R. 11 E.

A—0 to 3 inches; light reddish brown (5YR 6/4) loamy fine sand, reddish brown (5YR 5/4) moist; single grain; loose; very few fine roots; common fine interstitial pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.
C1—3 to 10 inches; light reddish brown (5YR 6/4) loamy fine sand, reddish brown (5YR 5/4) moist; massive; soft, very friable; few fine and medium roots; few fine tubular pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); gradual smooth boundary.
C2—10 to 40 inches; light reddish brown (5YR 6/4) loamy fine sand, reddish brown (5YR 5/4) moist; massive; soft, very friable; few fine roots; few fine tubular pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.0); gradual smooth boundary.
C3cs—40 to 60 inches; pink (5YR 7/4) loamy fine sand, light reddish brown (5YR 6/4) moist; massive; soft, very friable, slightly sticky and nonplastic; few fine roots; few fine tubular pores; common gypsum crystals and veins; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.0).

The profile has hue of 2.5YR to 7.5YR. The A horizon is absent in some pedons.

A horizon: Texture is loamy fine sand or sand. Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 6.

C horizon: Texture is loamy fine sand, fine sand, or sand. Clay content is 2 to 5 percent. Value is 5 to 7 when dry and 4 to 6 when moist, and chroma is 4 to 6.

Stormitt Series

The Stormitt series consists of very deep, well drained, moderately permeable soils on alluvial fans, benches, stream terraces, and hillsides. These soils formed in alluvium derived from diorite and sandstone. Slopes are 2 to 30 percent. Elevation is 4,800 to 6,000 feet. Average annual precipitation is 8 to 12 inches, and average annual air temperature is 47 to 50 degrees F.

These soils are loamy-skeletal, carbonatic, mesic Ustollic Calciorthids.

Typical pedon of Stormitt gravelly loam, 2 to 15 percent slopes, about 32 miles south of Hanksville, about 3,000 feet west and 1,200 feet south of the northeast corner of sec. 8, T. 33 S., R. 12 E.

A1—0 to 3 inches; reddish brown (5YR 5/3) gravelly loam, reddish brown (5YR 4/4) moist; weak very fine granular structure; soft, very friable, slightly sticky and slightly plastic; few fine roots; few fine interstitial pores; 20 percent pebbles; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.

B2—3 to 12 inches; reddish brown (5YR 5/4) very cobbly clay loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few fine and medium roots; few fine tubular pores; 40 percent cobbles and pebbles; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); gradual smooth boundary.

C1ca—12 to 18 inches; light reddish brown (5YR 6/3) very cobbly loam, reddish brown (5YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; few fine roots; few fine pores; 20 percent cobbles and 20 percent pebbles; very strongly calcareous; masses of calcium carbonate; moderately alkaline (pH 8.3); gradual wavy boundary.

C2ca—18 to 60 inches; pinkish white (5YR 8/2) very cobbly loam, pinkish gray (5YR 6/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; few fine pores; 30 percent cobbles and 20 percent pebbles; very strongly calcareous; masses of calcium carbonate; moderately alkaline (pH 8.4).

The calcic horizon is at a depth of 5 to 12 inches. The particle size control section is 35 to 60 percent rock fragments. The profile has hue of 5YR or 7.5YR. Calcium carbonate equivalent averages 40 to 60 percent in the 10- to 40-inch particle size control section.

A1 horizon: Texture is gravelly loam, cobbly loam, or extremely bouldery loam. Rock fragment content is 20 to 70 percent. Value is 5 or 6 when dry, and chroma is 3 or 4.

B2 horizon: Clay content is 27 to 35 percent. Rock fragment content is 20 to 50 percent.

C horizon: Rock fragment content is 35 to 50 percent. Value is 6 to 8 when dry and 5 or 6 when moist, and chroma is 2 to 4.

Strych Series

The Strych series consists of very deep, well drained, moderately rapidly permeable soils on alluvial fans and fan terraces. These soils formed in alluvium derived from sandstone and shale. Slopes are 2 to 15 percent. Elevation is 5,000 to 6,000 feet. Average annual precipitation is 8 to 10 inches, and average annual air temperature is 47 to 50 degrees F.

These soils are loamy-skeletal, mixed, mesic Ustollic Calciorthids.

Typical pedon of Strych gravelly fine sandy loam, 2 to 15 percent slopes, about 19 miles south of Hanksville, in the SE1/4 of sec. 21, T. 31 S., R. 11 E.

A11—0 to 3 inches; brown (7.5YR 5/4) gravelly fine sandy loam, brown (7.5YR 4/3) moist; weak medium platy structure; soft, very friable, slightly sticky and plastic; many fine roots; many fine pores; 15 percent pebbles; moderately calcareous; moderately alkaline (pH 8.4); clear wavy boundary.

A12—3 to 10 inches; brown (7.5YR 5/4) gravelly fine sandy loam, brown (7.5YR 4/3) moist; weak medium prismatic structure; slightly hard, very friable, slightly sticky and plastic; many fine roots; many fine pores; 15 percent pebbles; moderately calcareous; moderately alkaline (pH 8.4); clear wavy boundary.

C1ca—10 to 27 inches; pink (7.5YR 7/4) very cobbly sandy loam, light brown (7.5YR 6/3) moist; massive; slightly hard, very friable, slightly sticky and plastic; common fine roots; common fine pores; 45 percent cobbles and pebbles; strongly calcareous; strongly alkaline (pH 8.6); clear wavy boundary.

C2ca—27 to 48 inches; light brown (7.5YR 6/4) very cobbly sandy loam, brown (7.5YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and plastic; few fine roots; few fine pores; 50 percent cobbles and pebbles; strongly calcareous; strongly alkaline (pH 8.6); clear wavy boundary.

C3—48 to 60 inches, light brown (7.5YR 6/4) very cobbly sandy loam, brown (7.5YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; 60 percent cobbles and pebbles; strongly calcareous; moderately alkaline (pH 8.4).

The calcic horizon is at a depth of 10 to 15 inches.

A1 horizon: Rock fragment content is 15 to 30 percent. Hue is 7.5YR or 10YR, value is 5 to 6 when dry and 4 or 5 when moist, and chroma is 2 or 3.

C horizon: Clay content is 14 to 18 percent. Rock fragment content is 40 to 60 percent. Hue is 7.5YR or 10YR, value is 6 or 7 when dry and 4 to 6 when moist, and chroma is 2 to 4. Reaction is moderately alkaline or strongly alkaline.

Tolman Series

The Tolman series consists of shallow, well drained, moderately permeable soils on uplands and mountainsides. These soils formed in residuum and colluvium derived from sandstone and shale. Slopes are 30 to 50 percent. Elevation is 7,000 to 8,000 feet. Average annual precipitation is 14 to 16 inches, and average annual air temperature is 40 to 44 degrees F.

These soils are loamy-skeletal, mixed Lithic Argiborolls.

Typical pedon of a Tolman very cobbly fine sandy loam, 30 to 50 percent slopes, in an area of Tolman-

Rock outcrop complex, about 23 miles south of Hanksville, in the NW1/4 of sec. 1, T. 32 S., R. 10 E.

A11—0 to 3 inches; brown (7.5YR 5/2) very cobbly fine sandy loam, dark brown (7.5YR 3/2) moist; massive; soft, friable; few fine roots; many very fine and fine pores; 35 to 50 percent cobbles; moderately alkaline (pH 8.0); clear wavy boundary.
A12—3 to 9 inches; brown (7.5YR 5/2) very cobbly fine sandy loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine roots; many very fine and fine pores; 35 to 50 percent cobbles; moderately alkaline (pH 8.2); clear wavy boundary.
B2t—9 to 17 inches; light brown (7.5YR 6/4) very cobbly loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine and medium roots; common fine pores; 50 to 60 percent cobbles; moderately alkaline (pH 8.0); abrupt smooth boundary.
R—17 inches; sandstone.

Bedrock is at a depth of 10 to 20 inches. The mollic epipedon is 7 to 15 inches thick. Hue is 10YR or 7.5YR.

A1 horizon: Rock fragment content is 35 to 50 percent. Value is 4 or 5 when dry, and chroma is 2 or 3.

B2t horizon: Clay content is 18 to 24 percent. Rock fragment content is 40 to 60 percent. Value is 5 or 6 when dry and 3 or 4 when moist, and chroma is 2 to 4.

Trachute Series

The Trachute series consists of very deep, well drained, moderately rapidly permeable soils on benches and alluvial fans and in valleys. These soils formed in alluvium derived from sandstone. Slopes are 2 to 8 percent. Elevation is 4,300 to 5,200 feet. Average annual precipitation is 5 to 8 inches, and average annual air temperature is 50 to 52 degrees F.

These soils are coarse-loamy, mixed (calcareous), mesic Typic Torriorthents.

Typical pedon of a Trachute loamy fine sand, 2 to 8 percent slopes, severely eroded, in an area of Trachute-Sheppard complex, about 9 miles northeast of Hanksville, in the NW1/4SE1/4 of sec. 10, T. 27 S., R. 12 E.

A1—0 to 3 inches; reddish brown (2.5YR 5/4) loamy fine sand, reddish brown (2.5YR 4/4) moist; single grain; loose; few fine roots; common fine interstitial pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear smooth boundary.
C1—3 to 8 inches; reddish brown (2.5YR 5/4) fine sandy loam, reddish brown (2.5YR 4/4) moist; weak medium prismatic structure; soft, very friable; few fine and medium roots; few fine tubular pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); clear wavy boundary.
C2csca—8 to 30 inches; light reddish brown (2.5YR 6/4) fine sandy loam, reddish brown (2.5YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores; strongly calcareous; gypsum and calcium carbonate are in veins and disseminated; moderately alkaline (pH 8.4); gradual smooth boundary.
C3csca—30 to 60 inches; light reddish brown (2.5YR 6/4) fine sandy loam, reddish brown (2.5YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; few fine tubular pores; strongly calcareous; gypsum and calcium carbonate are in veins and disseminated; alkaline (pH 8.4).

The profile has hue of 2.5YR to 7.5YR.

A1 horizon: Value is 5 or 6 when dry, and chroma is 3 to 8. Reaction is moderately alkaline or strongly alkaline.

C horizon: Texture is fine sandy loam or sandy loam. Clay content is 12 to 18 percent. Value is 5 to 8 when dry and 4 or 5 when moist, and chroma is 3 to 8. Reaction is moderately alkaline or strongly alkaline. Gypsum crystals, seams, and veins are common.

Trail Series

The Trail series consists of very deep, well drained, rapidly permeable soils on alluvial fans. These soils formed in alluvium derived from sandstone and shale. Slopes are 1 to 2 percent. Elevation is 4,400 to 4,800 feet. Average annual precipitation is 5 to 7 inches, and average annual air temperature is 51 to 52 degrees F.

These soils are sandy, mixed, mesic Typic Torrifluvents.

Typical pedon of Trail loam about 0.3 mile west of the old church at Cainville, about 1,300 feet east and 2,600 feet north of the southwest corner of sec. 35, T. 28 S., R. 8 E.

Ap—0 to 10 inches; reddish brown (5YR 5/3) loam, reddish brown (5YR 4/4) moist; weak coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine, medium, and coarse roots; common fine, medium, and coarse pores; moderately calcareous; mildly alkaline (pH 7.6); gradual wavy boundary.
C1—10 to 16 inches; light reddish brown (5YR 6/4) sandy loam, reddish brown (5YR 5/4) moist; weak medium subangular blocky structure; soft, very friable; common fine and medium roots; common very fine and fine pores and few medium pores;

moderately calcareous; mildly alkaline (pH 7.6); gradual wavy boundary.

C2—16 to 27 inches; pink (5YR 7/4) loamy sand, reddish brown (5YR 5/3) moist; single grain; loose; common fine and medium roots; common very fine pores and few fine and medium pores; moderately calcareous; mildly alkaline (pH 7.6); gradual wavy boundary.

C3—27 to 45 inches; light reddish brown (5YR 6/4) loamy fine sand, reddish brown (5YR 4/4) moist; single grain; soft, very friable; few fine and medium roots; common very fine pores and few fine pores; moderately calcareous; moderately alkaline (pH 8.0); gradual wavy boundary.

C4—45 to 60 inches; pink (5YR 7/3) sand, reddish brown (5YR 5/3) moist; single grain; loose; few fine roots; few fine and very fine pores; moderately calcareous; moderately alkaline (pH 8.0).

The profile has hue of 5YR or 7.5YR. Texture is loamy fine sand or loamy sand; there are thin layers of sandy loam in the 10- to 40-inch particle size control section.

A1 horizon: Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 3 or 4.

C horizon: Texture is sand, loamy sand, loamy fine sand, or sandy loam. Clay content is 3 to 15 percent. Value is 6 or 7 when dry and 4 or 5 when moist, and chroma is 3 or 4.

Travessilla Series

The Travessilla series consists of shallow, well drained, moderately rapidly permeable soils on mesas, benches, uplands, hillsides, and mountainsides. These soils formed in residual and eolian material derived from sandstone. Slopes are 4 to 50 percent. Elevation is 5,000 to 6,500 feet. Average annual precipitation is 8 to 12 inches, and average annual air temperature is 47 to 52 degrees F.

These soils are loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents.

Typical pedon of a Travessilla fine sandy loam, 4 to 15 percent slopes, in an area of Travessilla-Rock outcrop complex, about 20 miles southwest of Hanksville, on Thompson Mesa, in the SW1/4 of sec. 18, T. 30 S., R. 9 E.

A1—0 to 6 inches; light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; moderate fine granular structure; soft, very friable, slightly sticky; few fine roots; many very fine and few fine pores; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.4); clear smooth boundary.

C—6 to 12 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; common fine pores; 5 percent pebbles; moderately calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.3); abrupt smooth boundary.

R—12 inches; sandstone.

Bedrock is at a depth of 6 to 20 inches. The profile has hue of 7.5YR or 10YR.

A1 horizon: Texture is fine sandy loam or channery sandy loam. Rock fragment content is 0 to 35 percent. Value is 5 to 7 when dry and 4 or 5 when moist, and chroma is 3 or 4.

C horizon: Texture is fine sandy loam or channery sandy loam. Clay content is 10 to 18 percent. Rock fragment content is 0 to 35 percent. Value is 5 to 7 when dry and 4 or 5 when moist, and chroma is 2 to 4.

Wayneco Series

The Wayneco series consists of shallow, well drained, moderately permeable soils on mesas, benches, ridges, and hillsides. These soils formed in residuum and colluvium derived from sandstone. Slopes are 2 to 30 percent. Elevation is 5,000 to 5,800 feet. Average annual precipitation is 8 to 10 inches, and average annual air temperature is 48 to 50 degrees F.

These soils are loamy, mixed, mesic Lithic Ustollic Calciorthids.

Typical pedon of a Wayneco fine sand, 4 to 8 percent slopes, in an area of Wayneco-Mido complex, about 25 miles southeast of Hanksville, in the SW1/4 of sec. 27, T. 31 S., R. 13 E.

A1—0 to 3 inches; yellowish red (5YR 5/6) fine sand, yellowish red (5YR 4/6) moist; single grain; loose; very few fine roots; slightly calcareous; moderately alkaline (pH 8.2); clear wavy boundary.

B2—3 to 9 inches; yellowish red (5YR 5/6) loamy fine sand, yellowish red (5YR 4/8) moist; weak coarse subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; very few fine roots; few fine and medium pores; strongly calcareous; moderately alkaline (pH 8.2); clear wavy boundary.

Cca—9 to 19 inches; reddish yellow (5YR 6/6) fine sandy loam, yellowish red (5YR 5/6) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; very few fine pores; strongly calcareous; strongly alkaline (pH 8.6); abrupt smooth boundary.

R—19 inches; sandstone.

Bedrock is at a depth of 10 to 20 inches. The calcic horizon is at a depth of 4 to 9 inches. Rock fragment content of the profile is 0 to 15 percent. The profile has hue of 7.5YR to 2.5YR.

A1 horizon: Texture is fine sand or fine sandy loam. Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 8.

C horizon: Texture is fine sandy loam or loam. Clay content is 5 to 18 percent. Value is 5 to 8 when dry and 4 to 7 when moist, and chroma is 4 to 8. Reaction is moderately alkaline or strongly alkaline.

Windwhistle Series

The Windwhistle series consists of moderately deep, well drained, moderately rapidly permeable soils on mesas. These soils formed in residual and eolian material derived from sandstone. Slopes are 2 to 8 percent. Elevation is 5,600 to 6,800 feet. Average annual precipitation is 8 to 12 inches, and average annual air temperature is 47 to 50 degrees F.

These soils are coarse-loamy, mixed, mesic Ustollic Haplargids.

Typical pedon of a Windwhistle loamy very fine sand, 2 to 8 percent slopes, in an area of Windwhistle-Rock outcrop complex, about 8 miles south of King Ranch, in the NE1/4NE1/4 of sec. 9, T. 33 S., R. 8 E.

A1—0 to 2 inches; brown (7.5YR 5/4) loamy very fine sand, brown (7.5YR 4/4) moist; single grain; loose, very friable; common fine and medium roots; mildly alkaline (pH 7.4); clear smooth boundary.

B2t—2 to 12 inches; brown (7.5YR 4/4) very fine sandy loam, dark brown (7.5YR 3/4) moist; weak coarse prismatic structure; slightly hard, very friable; common fine and medium roots; common fine and medium pores; mildly alkaline (pH 7.4); clear smooth boundary.

B3—12 to 20 inches; brown (7.5YR 4/4) very fine sandy loam, dark brown (7.5YR 3/4) moist; moderate medium and coarse subangular blocky structure; slightly hard, very friable; common fine and medium roots and few coarse roots; common fine pores; mildly alkaline (pH 7.5); clear smooth boundary.

Cca—20 to 28 inches; brown (7.5YR 5/4) very fine sandy loam, brown (7.5YR 4/4) moist; massive; slightly hard, very friable; common fine and few medium roots; common medium pores; slightly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.3); abrupt smooth boundary.

R—28 inches; sandstone.

Bedrock is at a depth of 20 to 40 inches.

A1 horizon: Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 3 or 4.

B2t horizon: Clay content is 13 to 18 percent. Value is 4 or 5 when dry and 3 to 5 when moist and chroma is 4 to 6.

C horizon: Clay content is 13 to 18 percent. Value is 5 or 6 when dry and 4 or 5 when moist.

Windwhistle Variant

The Windwhistle Variant consists of moderately deep, well drained, moderately permeable soils on mesas. These soils formed in alluvium and residuum derived from sandstone. Slopes are 2 to 8 percent. Elevation is 6,000 to 7,000 feet. Average annual precipitation is 10 to 13 inches, and average annual air temperature is 40 to 45 degrees F.

These soils are coarse-loamy, mixed, frigid Ustollic Haplargids.

Typical pedon of a Windwhistle Variant very fine sandy loam, 2 to 8 percent slopes, in an area of Redcreek-Windwhistle Variant complex, about 33 miles southwest of Hanksville, in the SW1/4 of sec. 33, T. 32 S., R. 9 E.

A1—0 to 7 inches; reddish brown (5YR 5/3) very fine sandy loam, brown (7.5YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); clear wavy boundary.

B2t—7 to 14 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and plastic; clay bridges between sand grains; slightly calcareous; few fine filaments of calcium carbonate; moderately alkaline (pH 8.4); clear wavy boundary.

C—14 to 26 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; massive; hard, friable, slightly sticky and plastic; slightly calcareous; few fine filaments of calcium carbonate; moderately alkaline (pH 8.4).

R—26 inches; sandstone.

Bedrock is at a depth of 20 to 40 inches. Clay content is 12 to 15 percent.

Yarts Series

The Yarts series consists of deep and very deep, well drained, moderately rapidly permeable soils on benches and alluvial fans and in valleys. These soils formed in alluvial and eolian material derived from sandstone. Slopes are 1 to 8 percent. Elevation is 5,000 to 6,000 feet. Average annual precipitation is 8 to 10 inches, and average annual air temperature is 48 to 50 degrees F

These soils are coarse-loamy, mixed (calcareous), mesic Ustic Torriorthents.

Typical pedon of Yarts fine sandy loam, 3 to 8 percent slopes, about 31 miles east of Hanksville, in the NW1/4 of sec. 31, T. 28 S., R. 15 E.

A1—0 to 3 inches; yellowish red (5YR 5/6) fine sandy loam, reddish brown (5YR 4/4) moist; weak thick platy structure; loose, very friable, slightly sticky and slightly plastic; few medium and fine roots; strongly calcareous; disseminated calcium carbonate;

moderately alkaline (pH 8.0); clear smooth boundary.

C1—3 to 10 inches; yellowish red (5YR 5/6) fine sandy loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine pores; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2); gradual wavy boundary.

C2—10 to 60 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine roots; strongly calcareous; disseminated calcium carbonate; moderately alkaline (pH 8.2).

Depth to bedrock commonly is more than 60 inches, but in some pedons it is at a depth of 40 to 60 inches. The profile has hue of 5YR or 7.5YR.

A1 horizon: Texture is fine sandy loam or loamy fine sand. Value is 5 or 6 when dry and 4 or 5 when moist, and chroma is 4 to 8.

C horizon: Texture is fine sandy loam or sandy loam. Clay content is 10 to 18 percent. Value is 5 to 8 when dry and 4 to 7 when moist, and chroma is 4 to 8. Reaction is mildly alkaline to strongly alkaline. In some pedons there is a Cca horizon below a depth of 40 inches.

References

(1) American Association of State Highway and Transportation Officials. 1982. Standard specifications for highway materials and methods of sampling and testing. Ed. 13, 2 vol., illus.

(2) American Society for Testing and Materials. 1985. Standard test method for classification of soils for engineering purposes. ASTM Stand. D 2487.

(3) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus. (Supplements replacing pp. 173-188 issued May 1962)

(4) United States Department of Agriculture. 1961. Land capability classification. U.S. Dep. Agric. Handb. 210, 21 pp.

(5) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436, 754 pp., illus.

Glossary

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone. The material washed down the sides of mountains and hills by ephemeral streams and deposited at the mouth of gorges in the form of a moderately steep, conical mass descending equally in all directions from the point of issue.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Animal-unit-month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Arroyo. The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in alluvium.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	More than 12

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Badland. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep to very steep broken land at the border of an upland summit that is dissected by ravines.

Brush management. Use of mechanical, chemical, or biological methods to reduce or eliminate competition of woody vegetation to allow understory grasses and forbs to recover, or to make conditions favorable for reseeding. It increases production of forage, which reduces erosion. Brush management may improve the habitat for some species of wildlife.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canyon. A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation by use of chemicals.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter, in diameter. As a soil textural

class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clay skin. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay film.

Climax plant community. The plant community on a given site that will be established if present environmental conditions continue to prevail and the site is properly managed.

Coarse fragments. Mineral or rock particles larger than 2 millimeters in diameter.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Very cobbly soil material is 35 to 60 percent of these rock fragments, and extremely cobbly soil material is more than 60 percent.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Congeliturbate. Soil material disturbed by frost action.

Conglomerate. A coarse grained, clastic rock composed of rounded to subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. If soil improving crops and practices used in the system more than offset the soil depleting crops and deteriorating practices, then it is a good conservation cropping system. Cropping systems are needed on all tilled soils. Soil improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—Readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—Adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system. Growing crops using a planned system of rotation and management practices.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Cuesta. An asymmetric, homoclinal ridge capped by resistant rock layers of slight to moderate dip.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or arresting grazing for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Desert pavement. A layer of gravel or coarser fragments on a desert soil surface that was emplaced by upward movement of fragments from

underlying sediment or remains after finer particles have been removed by running water or wind.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming with the dip of underlying bedded rock.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—These soils have very high and high hydraulic conductivity and low water holding capacity. They are not suited to crop production unless irrigated.

Somewhat excessively drained.—These soils have high hydraulic conductivity and low water holding capacity. Without irrigation, only a narrow range of crops can be grown and yields are low.

Well drained.—These soils have intermediate water holding capacity. They retain optimum amounts of moisture, but they are not wet close enough to the surface or long enough during the growing season to adversely affect yields.

Moderately well drained.—These soils are wet close enough to the surface or long enough that planting or harvesting operations or yields of some field crops are adversely affected unless artificial drainage is provided. Moderately well drained soils commonly have a layer with low hydraulic conductivity, a wet layer relatively high in the profile, additions of water by seepage, or some combination of these.

Somewhat poorly drained.—These soils are wet close enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless artificial drainage is provided. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, a wet layer high in the profile, additions of water through seepage, or a combination of these.

Poorly drained.—These soils commonly are so wet at or near the surface during a considerable part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these.

Very poorly drained.—These soils are wet to the surface most of the time. They are wet enough to prevent the growth of important crops (except rice) unless artificially drained.

Drainage, surface. Runoff, or surface flow of water, from an area.

Draw. A small stream valley, generally more open and with broader bottom land than a ravine or gulch.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature; for example, fire that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and produced by erosion or faulting. Synonym: scarp.

Excess alkali (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sulfur (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fast intake (in tables). The rapid movement of water into the soil.

Fine textured soil. Sandy clay, silty clay, and clay.

Flaggy soil material. Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material is 35 to 60 percent flagstones, and extremely flaggy soil material is more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (or 300 meters) and fringes a mountain range or high-plateau escarpment.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the sorted and unsorted material deposited by streams flowing from glaciers.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Hard rock. Rock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well-defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the number 2 precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Light textured soil. Sand and loamy sand.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mesa. A broad, nearly flat topped and commonly isolated upland mass characterized by summit widths that are more than the heights of bounding erosional scarps.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides and considerable bare-rock surface. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color in hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	Less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	More than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability or an impermeable layer near the surface, the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Prescribed burning. The application of fire to land under such conditions of weather, soil moisture, and time of day as presumably will result in the intensity of heat and spread required to accomplish specific forest management, wildlife, grazing, or fire hazard reduction purposes.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This increases the vigor and reproduction of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed

from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

	SAR
Slight	Less than 13:1
Moderate	13-30:1
Strong	More than 30:1

Soft rock. Rock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	Less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 6 to 15 inches (15 to 38 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Tail water. The water just downstream of a structure.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Too arid (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1967-80 at Bullfrog Basin, UT; elevation 3,822 feet]

Month	Temperature			Precipitation	
	Mean daily maximum	Mean daily minimum	Mean monthly	Mean monthly	Mean monthly snowfall
	°F	°F	°F	In	In
January----	43.4	23.7	33.5	0.71	1.8
February---	52.5	30.2	41.4	0.41	0.8
March------	61.8	36.5	49.2	0.62	0.2
April------	70.7	43.2	56.9	0.27	0
May--------	81.7	53.4	67.6	0.56	0
June-------	93.5	62.7	78.1	0.21	0
July-------	99.7	69.9	84.8	0.37	0
August-----	96.7	67.7	82.2	0.35	0
September--	87.6	58.7	73.2	0.41	0
October----	73.5	46.6	60.0	1.09	0
November---	57.5	35.1	46.3	0.61	0.4
December---	46.3	25.8	36.1	0.58	3.6
Annual----	72.1	46.1	59.9	6.19	6.8

TABLE 1.--TEMPERATURE AND PRECIPITATION--Continued

[Recorded in the period 1951-80 at Hanksville, UT; elevation 4,308 feet]

Month	Temperature			Precipitation	
	Mean daily maximum	Mean daily minimum	Mean monthly	Mean monthly	Mean monthly snowfall
	°F	°F	°F	In	In
January----	39.9	11.4	25.7	0.30	1.02
February---	48.7	19.5	34.1	0.22	0.74
March------	58.4	27.4	42.9	0.35	1.02
April------	68.8	36.1	52.4	0.42	0.01
May--------	80.0	45.9	63.0	0.49	0
June-------	91.4	54.3	72.9	0.23	0
July-------	98.0	61.9	80.0	0.44	0
August-----	94.4	59.7	77.1	0.83	0
September--	85.5	49.1	67.4	0.60	0
October----	71.8	37.0	54.4	0.63	0.34
November---	54.1	23.9	39.0	0.43	0.95
December---	42.1	14.3	28.2	0.30	2.14
Annual----	69.4	36.8	53.1	5.24	6.22

TABLE 1.--TEMPERATURE AND PRECIPITATION--Continued

[Recorded in the period 1968-80 at Hite Marina, UT; elevation 3,690 feet]

Month	Temperature			Precipitation	
	Mean daily maximum	Mean daily minimum	Mean monthly	Mean monthly	Mean monthly snowfall
	°F	°F	°F	In	In
January----	43.4	25.3	34.4	0.75	3.40
February---	52.3	31.3	41.8	0.36	0
March------	61.1	38.5	49.9	0.69	0
April------	70.4	45.8	58.1	0.42	0.03
May--------	80.4	55.7	68.1	0.46	0
June-------	91.9	66.0	79.0	0.11	0
July-------	98.6	73.7	86.2	0.45	0
August-----	95.9	72.4	84.1	0.40	0
September--	87.2	62.7	75.0	0.30	0
October----	73.6	50.3	61.9	0.85	0
November---	57.1	38.1	47.6	0.61	0.10
December---	47.9	29.4	38.7	0.57	0.60
Annual----	71.7	49.1	60.4	5.97	4.10

TABLE 2.--ESTIMATED MONTHLY PAN EVAPORATION

[Recorded in the period 1951-80 at Hanksville, UT; elevation 4,308 feet]

	In
January	0.38
February	0.92
March	3.15
April	6.40
May	9.32
June	11.87
July	12.65
August	10.55
September	7.38
October	4.43
November	1.69
December	0.78
Annual	69.50

TABLE 3.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Garfield County	Kane County	Wayne County	Total-- Area	Total-- Extent
		Acres	Acres	Acres	Acres	Pct
1	Badland	12,335	0	56,166	68,501	3.5
2	Badland-Hanksville complex	0	0	2,521	2,521	0.1
3	Badland-Rock outcrop complex	93,747	0	85,054	178,801	9.1
4	Begay loamy fine sand, 2 to 8 percent slopes	5,386	0	28,134	33,520	1.7
5	Begay fine sandy loam, 2 to 8 percent slopes	2,452	0	24,081	26,533	1.3
6	Begay-Mellenthin complex	0	0	5,090	5,090	0.3
7	Begay-Mido complex	0	0	4,068	4,068	0.2
8	Begay-Rizno complex	1,951	0	2,998	4,949	0.2
9	Billings silt loam	0	0	11,224	11,224	0.6
10	Billings silty clay loam	0	0	273	273	*
11	Billings silty clay loam, saline-alkali	0	0	232	232	*
12	Billings Variant clay	0	0	406	406	*
13	Blackston fine sandy loam	1,148	0	1,317	2,465	0.1
14	Blackston gravelly fine sandy loam, 4 to 8 percent slopes	1,316	0	3,489	4,805	0.2
15	Blackston gravelly fine sandy loam, 8 to 30 percent slopes	3,452	0	1,900	5,352	0.3
16	Blackston-Leebench complex	0	0	9,246	9,246	0.5
17	Bowdish loamy fine sand, 4 to 8 percent slopes	0	0	5,814	5,814	0.3
18	Bowdish-Mido complex	0	0	1,194	1,194	0.1
19	Bowdish Variant fine sandy loam	727	0	672	1,399	0.1
20	Canyon family-Rock outcrop complex	12,100	0	10,286	22,386	1.1
21	Cerrillos-Chipeta complex	2,713	0	0	2,713	0.1
22	Cerrillos Variant loam	0	0	883	883	*
23	Chipeta silty clay, 2 to 15 percent slopes	21,384	0	19,891	41,275	2.1
24	Chipeta gravelly silty clay, 30 to 60 percent slopes	9,825	0	8,813	18,638	0.9
25	Chipeta-Badland complex	16,906	0	35,539	52,445	2.6
26	Chipeta Variant-Badland-Rock outcrop complex	1,129	0	0	1,129	0.1
27	Circleville-Blazon complex	26,904	0	2,016	28,920	1.5
28	Delson cobbly loam, 15 to 30 percent slopes	1,641	0	0	1,641	0.1
29	Delson-Datino family complex	18,245	0	74	18,319	0.9
30	Delson-Makoti family complex	13,381	0	887	14,268	0.7
31	Duneland-Mido complex	0	0	1,029	1,029	0.1
32	Factory sandy loam, 2 to 8 percent slopes	859	0	1,535	2,394	0.1
33	Farb fine sandy loam, 4 to 15 percent slopes	1,352	0	0	1,352	0.1
34	Farb-Rock outcrop complex	10,018	0	12,117	22,135	1.1
35	Farb-Farb, very shallow-Rock outcrop complex	10,346	0	0	10,346	0.5
36	Glenberg family	1,639	0	2,564	4,203	0.2
37	Goblin-Chipeta complex	0	0	18,248	18,248	0.9
38	Green River-Myton families complex	17,371	0	0	17,371	0.9
39	Hanksville-Chipeta complex	0	0	18,550	18,550	0.9
40	Haverdad silt loam	6,591	0	8,427	15,018	0.8
41	Jocity loam	0	0	185	185	*
42	Jocity clay	0	0	320	320	*
43	Leebench gravelly clay loam, 4 to 8 percent slopes	557	0	1,902	2,459	0.1
44	Leebench-Hanksville complex	0	0	7,346	7,346	0.4
45	Mellenthin-Rock outcrop-Mido complex	16,260	0	45,600	61,860	3.1
46	Mido loamy fine sand, 4 to 15 percent slopes	1,416	0	9,457	10,873	0.5
47	Mido-Wayneco-Milok complex	2,213	0	9,850	12,063	0.6
48	Milok loamy fine sand, 4 to 8 percent slopes	2,094	0	1,333	3,427	0.2
49	Milok sandy loam	322	0	138	460	*
50	Milok-Begay complex	108	0	13,626	13,734	0.7
51	Milok-Chipeta complex	1,551	0	0	1,551	0.1
52	Milok-Mido complex	6,161	0	0	6,161	0.3
53	Milok-Pastern complex	4,027	0	0	4,027	0.2
54	Mivida loamy fine sand	0	0	3,771	3,771	0.2
55	Mivida-Goblin complex	0	0	574	574	*
56	Mivida Variant very cobbly very fine sandy loam, 15 to 40 percent slopes	494	0	0	494	*
57	Moenkopie fine sandy loam	2,377	0	1,299	3,676	0.2
58	Moenkopie-Chipeta complex	10,074	0	4,839	14,913	0.8
59	Moenkopie-Rock outcrop complex	62,175	605	41,859	104,639	5.4
60	Moffat loamy fine sand, 2 to 8 percent slopes	28,730	5,022	51,453	85,205	4.3
61	Moffat loamy fine sand, 8 to 15 percent slopes	0	0	1,589	1,589	0.1
62	Moffat-Sheppard complex	5,279	0	9,891	15,170	0.8
63	Montosa family, 4 to 8 percent slopes	23,438	0	3,010	26,448	1.3

See footnote at end of table.

TABLE 3.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Garfield County	Kane County	Wayne County	Total-- Area	Total-- Extent
		Acres	Acres	Acres	Acres	Pct
64	Monue loamy fine sand	4,809	1,147	10,816	16,772	0.8
65	Monue Variant-Farb-Rock outcrop complex	0	0	3,255	3,255	0.2
66	Myton family-Travessilla-Rock outcrop complex	2,642	0	557	3,199	0.2
67	Olnes family, 50 to 70 percent slopes	1,402	0	0	1,402	0.1
68	Olnes-Pando families complex	11,474	0	0	11,474	0.6
69	Otero-Glenberg families complex	2,720	0	6,322	9,042	0.5
70	Palma very fine sandy loam	800	0	0	800	*
71	Pando family-Rogert complex	16,125	0	131	16,256	0.8
72	Pastern cobbly fine sandy loam, 2 to 15 percent slopes	6,695	0	0	6,695	0.3
73	Pennell fine sandy loam, 2 to 8 percent slopes	11,055	0	6,675	17,730	0.9
74	Pennell-Moenkopie-Rock outcrop complex, 2 to 15 percent slopes	3,490	0	2,598	6,088	0.3
75	Pennell-Moenkopie-Rock outcrop complex, 15 to 50 percent slopes	14,321	0	0	14,321	0.7
76	Redcreek-Windwhistle Variant complex	4,684	0	0	4,684	0.2
77	Riverwash	136	0	5,810	5,946	0.3
78	Riverwash-Glenberg-Green River families complex	306	0	2,356	2,662	0.1
79	Riverwash-Neskahi family complex	0	0	1,101	1,101	0.1
80	Rizno fine sandy loam, 4 to 15 percent slopes	7,068	0	3,980	11,048	0.6
81	Rizno-Mido complex	4,142	0	6,697	10,839	0.5
82	Rizno-Rock outcrop complex	16,943	0	10,287	27,230	1.4
83	Rizno, warm-Rock outcrop complex	31,647	0	14,007	45,654	2.3
84	Robroost-Goblin complex	0	0	10,577	10,577	0.5
85	Robroost-Goblin complex, eroded	1,366	0	19,052	20,418	1.0
86	Rock outcrop	153,004	0	103,283	256,287	13.0
87	Rock outcrop-Arches complex	2,931	0	19,585	22,516	1.1
88	Rock outcrop-Chipeta complex	9,062	0	0	9,062	0.5
89	Rock outcrop-Chipeta-Canyon family complex	0	0	10,235	10,235	0.5
90	Rock outcrop-Farb complex	0	0	6,801	6,801	0.3
91	Rock outcrop-Montosa family complex	2,869	0	537	3,406	0.2
92	Rock outcrop-Stormitt-Rizno complex	2,549	0	0	2,549	0.1
93	Rock outcrop-Travessilla complex	23,771	0	28,687	52,458	2.6
94	Rock outcrop-Travessilla, warm complex	13,028	0	2,466	15,494	0.8
95	Rogert-Rogert Variant complex	8,829	0	0	8,829	0.4
96	Rubble land	585	0	0	585	*
97	Shedado complex	3,647	0	1,410	5,057	0.3
98	Sheppard sand, 2 to 8 percent slopes	324	0	17,690	18,014	0.9
99	Sheppard loamy fine sand, 2 to 8 percent slopes	7,415	15	37,867	45,297	2.3
100	Sheppard-Goblin complex	0	0	4,264	4,264	0.2
101	Sheppard-Leebench complex	0	0	1,681	1,681	0.1
102	Sheppard-Moenkopie complex	0	0	2,125	2,125	0.1
103	Sheppard-Moenkopie, warm complex	6,816	0	0	6,816	0.3
104	Sheppard-Pennell-Rock outcrop complex	3,103	0	0	3,103	0.2
105	Sheppard-Rock outcrop complex	0	0	4,800	4,800	0.2
106	Stormitt gravelly loam, 2 to 15 percent slopes	19,353	0	2,340	21,693	1.1
107	Stormitt extremely bouldery loam, 4 to 30 percent slopes	4,013	0	0	4,013	0.2
108	Stormitt-Rizno complex	6,110	0	0	6,110	0.3
109	Strych gravelly fine sandy loam, 2 to 15 percent slopes	10,312	0	8,550	18,862	1.0
110	Tolman-Rock outcrop complex	21,668	0	1,967	23,635	1.2
111	Trachute loamy fine sand, 2 to 8 percent slopes	0	0	1,985	1,985	0.1
112	Trachute-Goblin complex	0	0	3,424	3,424	0.2
113	Trachute-Sheppard complex	0	0	4,470	4,470	0.2
114	Trail loam	0	0	365	365	*
115	Travessilla-Badland-Rock outcrop complex	1,062	0	6,017	7,079	0.4
116	Travessilla-Rock outcrop complex	33,962	0	3,782	37,744	1.9
117	Wayneco-Mido complex	5,740	0	0	5,740	0.3
118	Wayneco-Milok-Rock outcrop complex	0	0	2,732	2,732	0.1
119	Wayneco-Rizno-Rock outcrop complex	16,666	0	8,126	24,792	1.2
120	Windwhistle-Rock outcrop complex	892	0	0	892	*
121	Yarts fine sandy loam, 1 to 3 percent slopes	248	0	22	270	*
122	Yarts fine sandy loam, 3 to 8 percent slopes	10,219	0	2,906	13,125	0.7
123	Yarts-Mido complex	0	0	2,652	2,652	0.1
124	Yarts-Mido complex, eroded	0	0	5,618	5,618	0.3
	Water	11,580	0	391	11,971	0.6
	Total	983,777	6,789	993,779	1,984,345	100.0

* Less than 0.1 percent.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES

[Only the soils that support vegetation suitable for grazing are listed, except those that are in map units that include such soils. Two asterisks identify a woodland site that supports grazeable understory]

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
2*:					
Badland.					
Hanksville	Desert Clay	Favorable	350	Wedgeleaf saltbush	30
		Normal	250	Galleta	15
		Unfavorable	150	Shadscale	15
				Indian ricegrass	10
4, 5 Begay	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Winterfat	5
				Mormon-tea	5
6*:					
Begay	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Winterfat	5
				Mormon-tea	5
Mellenthin	Semidesert Shallow Sand (Juniper-Pinyon)**.	Favorable	550	Galleta	20
		Normal	450	Shadscale	15
		Unfavorable	300	Indian ricegrass	10
				Eriogonum	5
				Fourwing saltbush	5
				Mormon-tea	5
7*:					
Begay	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Winterfat	5
				Mormon-tea	5
Mido	Semidesert Sand	Favorable	800	Indian ricegrass	20
		Normal	600	Needleandthread	10
		Unfavorable	300	Fourwing saltbush	10
				Mormon-tea	5
				Galleta	5
				Dropseed	5
				Sandhill muhly	5
				Sand sagebrush	5
8*:					
Begay	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Winterfat	5
				Mormon-tea	5
Rizno	Semidesert Shallow Sandy Loam	Favorable	500	Galleta	20
		Normal	300	Shadscale	15
		Unfavorable	100	Indian ricegrass	10
				Bigelow sagebrush	10
				Needleandthread	5
				Mormon-tea	5
				Broom snakeweed	5

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
9, 11 Billings	Alkali Flat	Favorable	1,000	Black greasewood	30
		Normal	750	Bottlebrush squirreltail	20
		Unfavorable	500	Alkali sacaton	10
				Galleta	5
				Seepweed	5
13 Blackston	Desert Stony Loam (Blackbrush)	Favorable	500	Blackbrush	40
		Normal	300	Galleta	15
		Unfavorable	200	Shadscale	5
				Torrey Mormon-tea	5
14 Blackston	Desert Stony Loam	Favorable	600	Galleta	20
		Normal	500	Shadscale	20
		Unfavorable	300	Bud sagebrush	10
				Indian ricegrass	10
				Sand dropseed	5
				Bigelow sagebrush	5
15 Blackston	Desert Stony Loam (Blackbrush)	Favorable	500	Blackbrush	40
		Normal	300	Galleta	15
		Unfavorable	200	Shadscale	5
				Torrey Mormon-tea	5
16*:					
Blackston	Desert Stony Loam	Favorable	600	Galleta	20
		Normal	500	Shadscale	20
		Unfavorable	300	Bud sagebrush	10
				Indian ricegrass	10
				Sand dropseed	5
				Bigelow sagebrush	5
Leebench	Alkali Fan	Favorable	300	Galleta	20
		Normal	225	Wedgeleaf saltbush	20
		Unfavorable	130	Indian ricegrass	15
				Deserttrumpet	5
				Globemallow	5
				Winterfat	5
				Bud sagebrush	5
17 Bowdish	Semidesert Sandy Loam (Blackbrush).	Favorable	700	Indian ricegrass	20
		Normal	500	Blackbrush	15
		Unfavorable	300	Galleta	10
				Mormon-tea	10
				Sand dropseed	5
				Needleandthread	5
				Fourwing saltbush	5
18*:					
Bowdish	Semidesert Sandy Loam (Blackbrush).	Favorable	700	Indian ricegrass	20
		Normal	500	Blackbrush	15
		Unfavorable	300	Galleta	10
				Mormon-tea	10
				Sand dropseed	5
				Needleandthread	5
				Fourwing saltbush	5
Mido	Semidesert Sand	Favorable	800	Indian ricegrass	20
		Normal	600	Needleandthread	10
		Unfavorable	300	Fourwing saltbush	10
				Mormon-tea	5
				Galleta	5
				Dropseed	5
				Sandhill muhly	5
				Sand sagebrush	5

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo-sition
			Lb/acre		Pct
19 Bowdish Variant	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Winterfat	5
				Mormon-tea	5
20*:					
Canyon family	Semidesert Very Shallow Sandy Loam.	Favorable	300	Littleleaf mountainmahogany	20
		Normal	225	Bigelow sagebrush	15
		Unfavorable	125	Needleandthread	10
				Shadscale	5
				Mormon-tea	5
				Utah juniper	5
Rock outcrop.					
21*:					
Cerrillos	Semidesert Stony Loam (Blackbrush).	Favorable	750	Blackbrush	35
		Normal	500	Blue grama	20
		Unfavorable	300	Indian ricegrass	15
				Mormon-tea	5
Chipeta	Desert Shallow Clay	Favorable	250	Mat saltbush	55
		Normal	175	Galleta	10
		Unfavorable	100	Indian ricegrass	5
				Deserttrumpet	5
22 Cerrillos Variant	Desert Loam	Favorable	400	Shadscale	25
		Normal	300	Galleta	15
		Unfavorable	150	Indian ricegrass	10
				Bud sagebrush	10
				Bottlebrush squirreltail	5
				Deserttrumpet	5
				Gray molly	5
23, 24 Chipeta	Desert Shallow Clay	Favorable	250	Mat saltbush	55
		Normal	175	Galleta	10
		Unfavorable	100	Indian ricegrass	5
				Deserttrumpet	5
25*:					
Chipeta	Desert Shallow Clay	Favorable	250	Mat saltbush	55
		Normal	175	Galleta	10
		Unfavorable	100	Indian ricegrass	5
				Deserttrumpet	5
Badland.					
26*:					
Chipeta Variant	Desert Shallow Clay (Shadscale).	Favorable	350	Galleta	25
		Normal	250	Shadscale	25
		Unfavorable	125	Torrey Mormon-tea	10
				Wedgeleaf saltbush	5
Badland.					
Rock outcrop.					

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
27*:					
Circleville	Upland Stony Loam	Favorable	1,500	Muttongrass	10
		Normal	900	Nevada bluegrass	10
		Unfavorable	700	Wyoming big sagebrush	10
				Blue grama	5
				Needleandthread	5
				Birchleaf mountainmahogany	5
				Green Mormon-tea	5
Blazon	Upland Shallow Loam (Pinyon-Juniper)**.	Favorable	600	Bigelow sagebrush	20
		Normal	400	Mormon-tea	15
		Unfavorable	100	Galleta	5
				Indian ricegrass	5
				Bluegrass	5
				Fine Douglas rabbitbrush	5
				Mexican cliffrose	5
				Round buffaloberry	5
				Pricklypear	5
28 Delson	Upland Gravelly Loam (Pinyon-Juniper)**.	Favorable	1,750	Bluebunch wheatgrass	10
		Normal	1,250	Muttongrass	10
		Unfavorable	1,000	Wyoming big sagebrush	10
				Blue grama	5
				Bottlebrush squirreltail	5
				Indian ricegrass	5
				Needleandthread	5
				Green Mormon-tea	5
29*:					
Delson	Mountain Loam (Oak)	Favorable	1,750	Gambel oak	30
		Normal	1,200	Bluegrass	10
		Unfavorable	650	Snowberry	10
				Wheatgrass	5
				Serviceberry	5
				Mountain big sagebrush	5
Datino family	Mountain Loam (Oak)	Favorable	1,750	Gambel oak	30
		Normal	1,200	Bluegrass	10
		Unfavorable	650	Snowberry	10
				Wheatgrass	5
				Serviceberry	5
				Mountain big sagebrush	5
30*:					
Delson	Upland Gravelly Loam (Pinyon-Juniper)**.	Favorable	1,750	Bluebunch wheatgrass	10
		Normal	1,250	Muttongrass	10
		Unfavorable	1,000	Wyoming big sagebrush	10
				Blue grama	5
				Bottlebrush squirreltail	5
				Indian ricegrass	5
				Needleandthread	5
				Green Mormon-tea	5
Makoti family	Upland Gravelly Loam (Pinyon-Juniper)**.	Favorable	1,750	Bluebunch wheatgrass	10
		Normal	1,250	Muttongrass	10
		Unfavorable	1,000	Wyoming big sagebrush	10
				Blue grama	5
				Bottlebrush squirreltail	5
				Indian ricegrass	5
				Needleandthread	5
				Green Mormon-tea	5
31*:					
Duneland.					

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
31*:					
Mido	Semidesert Sand	Favorable	800	Indian ricegrass	20
		Normal	600	Needleandthread	10
		Unfavorable	300	Fourwing saltbush	10
				Mormon-tea	5
				Galleta	5
				Dropseed	5
				Sandhill muhly	5
				Sand sagebrush	5
32 Factory	Semidesert Sandy Loam (Blackbrush).	Favorable	700	Indian ricegrass	20
		Normal	500	Blackbrush	15
		Unfavorable	300	Galleta	10
				Mormon-tea	10
				Sand dropseed	5
				Needleandthread	5
				Fourwing saltbush	5
33 Farb	Desert Shallow Sandy Loam	Favorable	400	Galleta	20
		Normal	300	Indian ricegrass	15
		Unfavorable	150	Shadscale	15
				Mormon-tea	5
				Blackbrush	5
34*:					
Farb	Desert Shallow Sandy Loam	Favorable	400	Galleta	20
		Normal	300	Indian ricegrass	15
		Unfavorable	150	Shadscale	15
				Mormon-tea	5
				Blackbrush	5
Rock outcrop.					
35*:					
Farb	Desert Shallow Sandy Loam	Favorable	400	Galleta	20
		Normal	300	Indian ricegrass	15
		Unfavorable	150	Shadscale	15
				Mormon-tea	5
				Blackbrush	5
Farb, very shallow	Desert Very Shallow Sandy Loam	Favorable	200	Bigelow sagebrush	25
		Normal	150	Shadscale	15
		Unfavorable	75	Indian ricegrass	10
				Mormon-tea	10
				Galleta	5
				Desert needlegrass	5
				Fourwing saltbush	5
				Blackbrush	5
Rock outcrop.					
36* Glenberg family	Semiwet Salt Streambank	Favorable	1,800	Alkali sacaton	35
		Normal	1,300	Coyote willow	15
		Unfavorable	900	Inland saltgrass	10
				Indian ricegrass	5
				Fremont cottonwood	5
				Rubber rabbitbrush	5
				Saltcedar	5
37*:					
Goblin	Desert Very Shallow Gypsum	Favorable	250	Torrey Mormon-tea	20
		Normal	150	Galleta	10
		Unfavorable	100	Indian ricegrass	10
				Shadscale	10
				Club eriogonum	5

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo-sition
			Lb/acre		Pct
37*:					
Chipeta	Desert Shallow Clay	Favorable	250	Mat saltbush	55
		Normal	175	Galleta	10
		Unfavorable	100	Indian ricegrass	5
				Deserttrumpet	5
38*:					
Green River family	Semiwet Salt Streambank	Favorable	1,800	Alkali sacaton	35
		Normal	1,300	Coyote willow	15
		Unfavorable	900	Inland saltgrass	10
				Indian ricegrass	5
				Fremont cottonwood	5
				Rubber rabbitbrush	5
				Saltcedar	5
Myton family extremely bouldery loam	Talus Slope	Favorable	350	Blackbrush	15
		Normal	225	Saline wildrye	10
		Unfavorable	100	Galleta	10
				Bigelow sagebrush	5
				Indian ricegrass	5
				Shadscale	5
				Mormon-tea	5
				Skunkbrush sumac	5
Myton family very gravelly sandy loam	Desert Stony Loam	Favorable	600	Galleta	20
		Normal	500	Shadscale	20
		Unfavorable	300	Bud sagebrush	10
				Indian ricegrass	10
				Sand dropseed	5
				Bigelow sagebrush	5
39*:					
Hanksville	Desert Clay	Favorable	350	Wedgeleaf saltbush	30
		Normal	250	Galleta	15
		Unfavorable	150	Shadscale	15
				Indian ricegrass	10
Chipeta	Desert Shallow Clay	Favorable	250	Mat saltbush	55
		Normal	175	Galleta	10
		Unfavorable	100	Indian ricegrass	5
				Deserttrumpet	5
40 Haverdad	Alkali Flat	Favorable	1,000	Black greasewood	30
		Normal	750	Bottlebrush squirreltail	20
		Unfavorable	500	Alkali sacaton	10
				Galleta	5
				Seepweed	5
43 Leebench	Alkali Fan	Favorable	300	Galleta	20
		Normal	225	Wedgeleaf saltbush	20
		Unfavorable	130	Indian ricegrass	15
				Deserttrumpet	5
				Globemallow	5
				Winterfat	5
				Bud sagebrush	5

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo- sition
			Lb/acre		Pct
44*:					
Leebench	Alkali Fan	Favorable	300	Galleta	20
		Normal	225	Wedgeleaf saltbush	20
		Unfavorable	130	Indian ricegrass	15
				Deserttrumpet	5
				Globemallow	5
				Winterfat	5
				Bud sagebrush	5
Hanksville	Desert Clay	Favorable	350	Wedgeleaf saltbush	30
		Normal	250	Galleta	15
		Unfavorable	150	Shadscale	15
				Indian ricegrass	10
45*:					
Mellenthin	Semidesert Shallow Sand (Juniper-Pinyon)**.	Favorable	550	Galleta	20
		Normal	450	Shadscale	15
		Unfavorable	300	Indian ricegrass	10
				Eriogonum	5
				Fourwing saltbush	5
				Mormon-tea	5
Rock outcrop.					
Mido	Semidesert Sand	Favorable	800	Indian ricegrass	20
		Normal	600	Needleandthread	10
		Unfavorable	300	Fourwing saltbush	10
				Mormon-tea	5
				Galleta	5
				Dropseed	5
				Sandhill muhly	5
				Sand sagebrush	5
46 Mido	Semidesert Sand	Favorable	800	Indian ricegrass	20
		Normal	600	Needleandthread	10
		Unfavorable	300	Fourwing saltbush	10
				Mormon-tea	5
				Galleta	5
				Dropseed	5
				Sandhill muhly	5
				Sand sagebrush	5
47*:					
Mido	Semidesert Sand	Favorable	800	Indian ricegrass	20
		Normal	600	Needleandthread	10
		Unfavorable	300	Fourwing saltbush	10
				Mormon-tea	5
				Galleta	5
				Dropseed	5
				Sandhill muhly	5
				Sand sagebrush	5
Wayneco	Semidesert Shallow Sandy Loam (Blackbrush).	Favorable	500	Blackbrush	65
		Normal	350	Indian ricegrass	5
		Unfavorable	200	Galleta	5
				Torrey Mormon-tea	5
				Bigelow sagebrush	5
Milok	Semidesert Sandy Loam (Blackbrush).	Favorable	700	Indian ricegrass	20
		Normal	500	Blackbrush	15
		Unfavorable	300	Galleta	10
				Mormon-tea	10
				Sand dropseed	5
				Needleandthread	5
				Fourwing saltbush	5

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
48 Milok	Semidesert Sandy Loam (Blackbrush).	Favorable	700	Indian ricegrass	20
		Normal	500	Blackbrush	15
		Unfavorable	300	Galleta	10
				Mormon-tea	10
				Sand dropseed	5
				Needleandthread	5
				Fourwing saltbush	5
50*:					
Milok	Semidesert Sandy Loam (Blackbrush).	Favorable	700	Indian ricegrass	20
		Normal	500	Blackbrush	15
		Unfavorable	300	Galleta	10
				Mormon-tea	10
				Sand dropseed	5
				Needlandthread	5
				Fourwing saltbush	5
Begay	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Winterfat	5
				Mormon-tea	5
51*:					
Milok	Semidesert Sandy Loam (Blackbrush).	Favorable	700	Indian ricegrass	20
		Normal	500	Blackbrush	15
		Unfavorable	300	Galleta	10
				Mormon-tea	10
				Sand dropseed	5
				Needlandthread	5
				Fourwing saltbush	5
Chipeta	Desert Shallow Clay	Favorable	250	Mat saltbush	55
		Normal	175	Galleta	10
		Unfavorable	100	Indian ricegrass	5
				Deserttrumpet	5
52*:					
Milok	Semidesert Sandy Loam (Blackbrush).	Favorable	700	Indian ricegrass	20
		Normal	500	Blackbrush	15
		Unfavorable	300	Galleta	10
				Mormon-tea	10
				Sand dropseed	5
				Needleandthread	5
				Fourwing saltbush	5
Mido	Semidesert Sand	Favorable	800	Indian ricegrass	20
		Normal	600	Needleandthread	10
		Unfavorable	300	Fourwing saltbush	10
				Mormon-tea	5
				Galleta	5
				Dropseed	5
				Sandhill muhly	5
				Sand sagebrush	5
53*:					
Milok	Semidesert Sandy Loam (Blackbrush).	Favorable	700	Indian ricegrass	20
		Normal	500	Blackbrush	15
		Unfavorable	300	Galleta	10
				Mormon-tea	10
				Sand dropseed	5
				Needleandthread	5
				Fourwing saltbush	5

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo-sition
			Lb/acre		Pct
53*:					
Pastern	Semidesert Shallow Sandy Loam (Blackbrush).	Favorable	500	Blackbrush	65
		Normal	350	Indian ricegrass	5
		Unfavorable	200	Galleta	5
				Torrey Mormon-tea	5
				Bigelow sagebrush	5
54 Mivida	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Mormon-tea	5
				Winterfat	5
55*:					
Mivida	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Mormon-tea	5
				Winterfat	5
Goblin	Desert Very Shallow Gypsum	Favorable	250	Torrey Mormon-tea	20
		Normal	150	Galleta	10
		Unfavorable	100	Indian ricegrass	10
				Shadscale	10
				Club eriogonum	5
56 Mivida Variant	Talus Slope	Favorable	350	Blackbrush	15
		Normal	225	Saline wildrye	10
		Unfavorable	100	Galleta	10
				Bigelow sagebrush	5
				Indian ricegrass	5
				Shadscale	5
				Mormon-tea	5
				Skunkbush sumac	5
57 Moenkopie	Desert Shallow Sandy Loam	Favorable	400	Galleta	20
		Normal	300	Indian ricegrass	15
		Unfavorable	150	Shadscale	15
				Mormon-tea	5
				Blackbrush	5
58*:					
Moenkopie	Desert Shallow Sandy Loam	Favorable	400	Galleta	20
		Normal	300	Indian ricegrass	15
		Unfavorable	150	Shadscale	15
				Mormon-tea	5
				Blackbrush	5
Chipeta	Desert Shallow Clay	Favorable	250	Mat saltbush	55
		Normal	175	Galleta	10
		Unfavorable	100	Indian ricegrass	5
				Deserttrumpet	5
59*:					
Moenkopie fine sandy loam	Desert Shallow Sandy Loam	Favorable	400	Galleta	20
		Normal	300	Indian ricegrass	15
		Unfavorable	150	Shadscale	15
				Mormon-tea	5
				Blackbrush	5

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
59*:					
Moenkopie channery sandy loam	Desert Very Shallow Sandy Loam	Favorable	200	Bigelow sagebrush	25
		Normal	150	Shadscale	15
		Unfavorable	75	Indian ricegrass	10
				Mormon-tea	10
				Galleta	5
				Desert needlegrass	5
				Blackbrush	5
Rock outcrop.					
60, 61 Moffat	Desert Sandy Loam (Blackbrush)	Favorable	600	Blackbrush	25
		Normal	400	Indian ricegrass	20
		Unfavorable	200	Galleta	15
				Mormon-tea	10
				Spike dropseed	5
62*:					
Moffat	Desert Sandy Loam (Blackbrush)	Favorable	600	Blackbrush	25
		Normal	400	Indian ricegrass	20
		Unfavorable	200	Galleta	15
				Mormon-tea	10
				Spike dropseed	5
Sheppard	Desert Sand	Favorable	650	Indian ricegrass	30
		Normal	500	Fourwing saltbush	10
		Unfavorable	350	Spike dropseed	10
				Needleandthread	5
				Mormon-tea	5
				Sand dropseed	5
				Sand sagebrush	5
63* Montosa family	Upland Stony Loam (Pinyon-Juniper)**.	Favorable	1,000	Green Mormon-tea	10
		Normal	700	Nevada bluegrass	10
		Unfavorable	500	Muttongrass	10
				Rock goldenrod	10
				Blue grama	5
				Prairie junegrass	5
64 Monue	Desert Sandy Loam	Favorable	600	Indian ricegrass	35
		Normal	400	Galleta	15
		Unfavorable	200	Dropseed	10
				Fourwing saltbush	10
				Globemallow	5
				Mormon-tea	5
				Winterfat	5
65*:					
Monue Variant	Desert Sandy Loam	Favorable	600	Indian ricegrass	35
		Normal	400	Galleta	15
		Unfavorable	200	Dropseed	10
				Fourwing saltbush	10
				Globemallow	5
				Mormon-tea	5
				Winterfat	5
Farb	Desert Shallow Sandy Loam	Favorable	400	Galleta	20
		Normal	300	Indian ricegrass	15
		Unfavorable	150	Shadscale	15
				Mormon-tea	5
				Blackbrush	5
Rock outcrop.					

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production		Characteristic vegetation	Compo-sition
		Kind of year	Dry weight		
			Lb/acre		Pct
66*:					
Myton family	Talus Slope	Favorable	350	Blackbrush	15
		Normal	225	Saline wildrye	10
		Unfavorable	100	Galleta	10
				Indian ricegrass	5
				Mormon-tea	5
				Shadscale	5
				Skunkbush sumac	5
Travessilla	Semidesert Shallow Sandy Loam	Favorable	500	Galleta	20
		Normal	300	Shadscale	15
		Unfavorable	100	Indian ricegrass	10
				Bigelow sagebrush	10
				Needleandthread	5
				Mormon-tea	5
				Broom snakeweed	5
Rock outcrop.					
67* Olnes family	High Mountain Stony Loam (Engelmann Spruce)**.	Favorable	110	Blueberry	50
		Normal	100	Oregon-grape	15
		Unfavorable	90	Sedge	10
				Pinegrass	10
				Currant	10
68*:					
Olnes family	High Mountain Stony Loam (Engelmann Spruce)**.	Favorable	110	Blueberry	50
		Normal	100	Oregon-grape	15
		Unfavorable	90	Sedge	10
				Pinegrass	10
				Current	10
Pando family.					
69*:					
Otero family	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Mormon-tea	5
				Winterfat	5
Glenberg family	Sandy Bottom	Favorable	900	Indian ricegrass	25
		Normal	650	Fourwing saltbush	15
		Unfavorable	400	Galleta	15
				Sand dropseed	5
				Mesa dropseed	5
				Needleandthread	5
				Globemallow	5
70 Palma	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Mormon-tea	5
				Winterfat	5
71*:					
Pando family.					

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
71*:					
Rogert	Mountain Shallow Loam (Black Sagebrush).	Favorable	1,000	Bluegrass	20
		Normal	750	Black sagebrush	20
		Unfavorable	500	Bluebunch wheatgrass	10
				Saline wildrye	10
72 Pastern	Semidesert Shallow Sandy Loam (Blackbrush).	Favorable	500	Blackbrush	65
		Normal	350	Indian ricegrass	5
		Unfavorable	200	Galleta	5
				Mormon-tea	5
				Bigelow sagebrush	5
73 Pennell	Desert Shallow Sandy Loam	Favorable	400	Galleta	20
		Normal	300	Indian ricegrass	15
		Unfavorable	150	Shadscale	15
				Blackbrush	5
				Mormon-tea	5
74*, 75*:					
Pennell	Desert Shallow Sandy Loam	Favorable	400	Galleta	20
		Normal	300	Indian ricegrass	15
		Unfavorable	150	Shadscale	15
				Blackbrush	5
				Mormon-tea	5
Moenkopie	Desert Very Shallow Sandy Loam (Blackbrush).	Favorable	200	Blackbrush	60
		Normal	150	Galleta	10
		Unfavorable	75	Mormon-tea	10
				Indian ricegrass	5
				Shadscale	5
Rock outcrop.					
76*:					
Redcreek	Upland Shallow Loam (Pinyon-Juniper)**.	Favorable	600	Bigelow sagebrush	20
		Normal	400	Mormon-tea	15
		Unfavorable	100	Galleta	5
				Indian ricegrass	5
				Bluegrass	5
				Fine Douglas rabbitbrush	5
				Mexican cliffrose	5
				Roundleaf buffaloberry	5
				Pricklypear	5
Windwhistle Variant	Upland Shallow Loam (Pinyon-Juniper)**.	Favorable	600	Bigelow sagebrush	20
		Normal	400	Mormon-tea	15
		Unfavorable	100	Galleta	5
				Indian ricegrass	5
				Bluegrass	5
				Fine Douglas rabbitbrush	5
				Mexican cliffrose	5
				Roundleaf buffaloberry	5
				Pricklypear	5
78*:					
Riverwash.					
Glenberg family	Alkali Bottom	Favorable	900	Black greasewood	45
		Normal	800	Alkali sacaton	20
		Unfavorable	700	Seepweed	10
				Sand dropseed	5
				Bottlebrush squirreltail	5

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
78*:					
Green River family	Semiwet Salt Streambank	Favorable	1,800	Alkali sacaton	35
		Normal	1,300	Coyote willow	15
		Unfavorable	900	Inland saltgrass	10
				Indian ricegrass	5
				Fremont cottonwood	5
				Rubber rabbitbrush	5
				Saltcedar	5
79*:					
Riverwash.					
Neskahi family	Alkali Flat	Favorable	1,000	Black greasewood	30
		Normal	750	Bottlebrush squirreltail	20
		Unfavorable	500	Alkali sacaton	10
				Galleta	5
				Seepweed	5
80 Rizno	Semidesert Shallow Sandy Loam (Blackbrush).	Favorable	500	Blackbrush	65
		Normal	350	Indian ricegrass	5
		Unfavorable	200	Galleta	5
				Torrey Mormon-tea	5
				Bigelow sagebrush	5
81*:					
Rizno	Semidesert Shallow Sandy Loam (Blackbrush).	Favorable	500	Blackbrush	65
		Normal	350	Indian ricegrass	5
		Unfavorable	200	Galleta	5
				Torrey Mormon-tea	5
				Bigelow sagebrush	5
Mido	Semidesert Sand	Favorable	800	Indian ricegrass	20
		Normal	600	Needleandthread	10
		Unfavorable	300	Fourwing saltbush	10
				Mormon-tea	5
				Galleta	5
				Dropseed	5
				Sandhill muhly	5
				Sand sagebrush	5
82*:					
Rizno	Semidesert Shallow Sandy Loam (Juniper-Pinyon)**.	Favorable	400	Blackbrush	35
		Normal	300	Mormon-tea	10
		Unfavorable	150	Galleta	5
				Indian ricegrass	5
Rock outcrop.					
83*:					
Rizno	Semidesert Shallow Sandy Loam (Blackbrush).	Favorable	500	Blackbrush	65
		Normal	350	Indian ricegrass	5
		Unfavorable	200	Galleta	5
				Torrey Mormon-tea	5
				Bigelow sagebrush	5
Rock outcrop.					
84*, 85*:					
Robroost	Desert Gypsum Loam	Favorable	450	Torrey Mormon-tea	25
		Normal	300	Galleta	20
		Unfavorable	150	Indian ricegrass	15
				Corybed eriogonum	10
				Shadscale	5
				Locoweed	5

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production		Characteristic vegetation	Compo-sition
		Kind of year	Dry weight		
			Lb/acre		Pct
84*, 85*:					
Goblin	Desert Very Shallow Gypsum	Favorable	250	Torrey Mormon-tea	20
		Normal	150	Galleta	10
		Unfavorable	100	Indian ricegrass	10
				Shadscale	10
				Club eriogonum	5
87*:					
Rock outcrop.					
Arches	Semidesert Shallow Sand (Juniper-Pinyon)**.	Favorable	550	Galleta	20
		Normal	450	Shadscale	15
		Unfavorable	300	Indian ricegrass	10
				Fourwing saltbush	5
				Mormon-tea	5
				Eriogonum	5
88*:					
Rock outcrop.					
Chipeta	Desert Shallow Clay	Favorable	250	Mat saltbush	55
		Normal	175	Galleta	10
		Unfavorable	100	Indian ricegrass	5
				Deserttrumpet	5
89*:					
Rock outcrop.					
Chipeta	Desert Shallow Clay	Favorable	250	Mat saltbush	55
		Normal	175	Galleta	10
		Unfavorable	100	Indian ricegrass	5
				Deserttrumpet	5
Canyon family	Semidesert Shallow Clay (Shadscale).	Favorable	350	Galleta	25
		Normal	250	Shadscale	25
		Unfavorable	125	Torrey Mormon-tea	10
				Wedgeleaf saltbush	5
90*:					
Rock outcrop.					
Farb	Desert Very Shallow Sandy Loam	Favorable	200	Bigelow sagebrush	25
		Normal	150	Shadscale	15
		Unfavorable	75	Indian ricegrass	10
				Mormon-tea	10
				Galleta	5
				Desert needlegrass	5
				Fourwing saltbush	5
				Blackbrush	5
91*:					
Rock outcrop.					
Montosa family	Upland Stony Loam (Pinyon-Juniper)**.	Favorable	1,000	Green Mormon-tea	10
		Normal	700	Nevada bluegrass	10
		Unfavorable	500	Muttongrass	10
				Rock goldenrod	10
				Blue grama	5
				Prairie junegrass	5

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
92*:					
Rock outcrop.					
Stormitt	Semidesert Stony Loam (Blackbrush).	Favorable	750	Blackbrush	35
		Normal	500	Galleta	20
		Unfavorable	300	Indian ricegrass	15
				Mormon-tea	5
Rizno	Semidesert Shallow Sandy Loam (Blackbrush).	Favorable	500	Blackbrush	65
		Normal	350	Indian ricegrass	5
		Unfavorable	200	Galleta	5
				Torrey Mormon-tea	5
				Bigelow sagebrush	5
93*:					
Rock outcrop.					
Travessilla	Semidesert Shallow Sandy Loam.	Favorable	500	Galleta	20
		Normal	300	Shadscale	15
		Unfavorable	100	Indian ricegrass	10
				Bigelow sagebrush	10
				Needleandthread	5
				Mormon-tea	5
				Broom snakeweed	5
94*:					
Rock outcrop.					
Travessilla	Semidesert Very Shallow Sandy Loam (Blackbrush).	Favorable	325	Blackbrush	70
		Normal	250	Galleta	10
		Unfavorable	150	Mormon-tea	5
95*:					
Rogert	Mountain Shallow Loam (Black Sagebrush).	Favorable	1,000	Bluegrass	20
		Normal	750	Black sagebrush	20
		Unfavorable	500	Bluebunch wheatgrass	10
				Saline wildrye	10
Rogert Variant	Mountain Shallow Loam (Black Sagebrush).	Favorable	1,000	Bluegrass	20
		Normal	750	Black sagebrush	20
		Unfavorable	500	Bluebunch wheatgrass	10
				Saline wildrye	10
97*:					
Shedado loamy fine sand	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Winterfat	5
				Mormon-tea	5
Shedado fine sandy loam	Semidesert Shallow Sandy Loam	Favorable	500	Galleta	20
		Normal	300	Shadscale	15
		Unfavorable	100	Indian ricegrass	10
				Bigelow sagebrush	10
				Needleandthread	5
				Mormon-tea	5
				Broom-snakeweed	5

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
98, 99: Sheppard	Desert Sand	Favorable	650	Indian ricegrass	30
		Normal	500	Fourwing saltbush	10
		Unfavorable	350	Spike dropseed	10
				Needleandthread	5
				Mormon-tea	5
				Sand dropseed	5
				Sand sagebrush	5
100*:					
Sheppard	Desert Sand	Favorable	650	Indian ricegrass	30
		Normal	500	Fourwing saltbush	10
		Unfavorable	350	Spike dropseed	10
				Needleandthread	5
				Mormon-tea	5
				Sand dropseed	5
				Sand sagebrush	5
Goblin	Desert Very Shallow Gypsum	Favorable	250	Torrey Mormon-tea	20
		Normal	150	Galleta	10
		Unfavorable	100	Indian ricegrass	10
				Shadscale	10
				Club eriogonum	5
101*:					
Sheppard	Desert Sand	Favorable	650	Indian ricegrass	30
		Normal	500	Fourwing saltbush	10
		Unfavorable	350	Spike dropseed	10
				Needleandthread	5
				Mormon-tea	5
				Sand dropseed	5
				Sand sagebrush	5
Leebench	Alkali Fan	Favorable	300	Galleta	20
		Normal	225	Wedgeleaf saltbush	20
		Unfavorable	130	Indian ricegrass	15
				Deserttrumpet	5
				Globemallow	5
				Winterfat	5
				Bud sagebrush	5
102*:					
Sheppard	Desert Sand	Favorable	650	Indian ricegrass	30
		Normal	500	Fourwing saltbush	10
		Unfavorable	350	Spike dropseed	10
				Needleandthread	5
				Mormon-tea	5
				Sand dropseed	5
				Sand sagebrush	5
Moenkopie	Desert Very Shallow Sandy Loam	Favorable	200	Bigelow sagebrush	25
		Normal	150	Shadscale	15
		Unfavorable	75	Indian ricegrass	10
				Mormon-tea	10
				Galleta	5
				Desert needlegrass	5
				Blackbrush	5
103*:					
Sheppard	Desert Sand	Favorable	650	Indian ricegrass	30
		Normal	500	Fourwing saltbush	10
		Unfavorable	350	Spike dropseed	10
				Needleandthread	5
				Mormon-tea	5
				Sand dropseed	5
				Sand sagebrush	5

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
103*:					
Moenkopie	Desert Very Shallow Sandy Loam (Blackbrush).	Favorable	200	Blackbrush	60
		Normal	150	Galleta	10
		Unfavorable	75	Mormon-tea	10
				Indian ricegrass	5
				Shadscale	5
104*:					
Sheppard	Desert Sand	Favorable	650	Indian ricegrass	30
		Normal	500	Fourwing saltbush	10
		Unfavorable	350	Spike dropseed	10
				Needleandthread	5
				Mormon-tea	5
				Sand dropseed	5
				Sand sagebrush	5
Pennell	Desert Shallow Sandy Loam	Favorable	400	Galleta	20
		Normal	300	Indian ricegrass	15
		Unfavorable	150	Shadscale	15
				Blackbrush	5
				Mormon-tea	5
Rock outcrop.					
105*:					
Sheppard	Desert Sand	Favorable	650	Indian ricegrass	30
		Normal	500	Fourwing saltbush	10
		Unfavorable	350	Spike dropseed	10
				Needleandthread	5
				Mormon-tea	5
				Sand dropseed	5
				Sand sagebrush	5
Rock outcrop.					
106 Stormitt	Semidesert Stony Loam (Blackbrush).	Favorable	750	Blackbrush	35
		Normal	500	Galleta	20
		Unfavorable	300	Indian ricegrass	15
				Mormon-tea	5
107 Stormitt	Semidesert Bouldery Fan	Favorable	600	Blackbrush	15
		Normal	450	Galleta	15
		Unfavorable	300	Black grama	10
				Bush muhly	10
				Desert needlegrass	10
				Blue grama	5
				Indian ricegrass	5
				Fourwing saltbush	5
				Mormon-tea	5
				Spiny hopsage	5
108*:					
Stormitt	Semidesert Stony Loam (Blackbrush).	Favorable	750	Blackbrush	35
		Normal	500	Galleta	20
		Unfavorable	300	Indian ricegrass	15
				Mormon-tea	5
Rizno	Semidesert Shallow Sandy Loam (Blackbrush).	Favorable	500	Blackbrush	65
		Normal	350	Indian ricegrass	5
		Unfavorable	200	Galleta	5
				Torrey Mormon-tea	5
				Bigelow sagebrush	5

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo-sition
			Lb/acre		Pct
109 Strych	Semidesert Stony Loam	Favorable	900	Galleta	15
		Normal	700	Blue grama	10
		Unfavorable	500	Indian ricegrass	10
				Fourwing saltbush	10
				Shadscale	10
				Mormon-tea	5
110*:					
Tolman	Upland Shallow Loam (Pinyon-Juniper)**.	Favorable	600	Bigelow sagebrush	20
		Normal	400	Mormon-tea	15
		Unfavorable	100	Galleta	5
				Indian ricegrass	5
				Bluegrass	5
				Fine Douglas rabbitbrush	5
				Mexican cliffrose	5
				Roundleaf buffaloberry	5
				Pricklypear	5
Rock outcrop.					
111 Trachute	Desert Sandy Loam	Favorable	600	Indian ricegrass	35
		Normal	400	Galleta	15
		Unfavorable	200	Dropseed	10
				Fourwing saltbush	10
				Globemallow	5
				Mormon-tea	5
				Winterfat	5
112*:					
Trachute	Desert Sandy Loam	Favorable	600	Indian ricegrass	35
		Normal	400	Galleta	15
		Unfavorable	200	Dropseed	10
				Fourwing saltbush	10
				Globemallow	5
				Mormon-tea	5
				Winterfat	5
Goblin	Desert Very Shallow Gypsum	Favorable	250	Torrey Mormon-tea	20
		Normal	150	Galleta	10
		Unfavorable	100	Indian ricegrass	10
				Shadscale	10
				Club eriogonum	5
113*:					
Trachute	Desert Sandy Loam	Favorable	600	Indian ricegrass	35
		Normal	400	Galleta	15
		Unfavorable	200	Dropseed	10
				Globemallow	10
				Fourwing saltbush	5
				Mormon-tea	5
				Winterfat	5
Sheppard	Desert Sand	Favorable	650	Indian ricegrass	30
		Normal	500	Fourwing saltbush	10
		Unfavorable	350	Spike dropseed	10
				Needleandthread	5
				Mormon-tea	5
				Sand dropseed	5
				Sand sagebrush	5

See footnote at end of table.

TABLE 4.--RANGELAND WOODLAND AND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo-sition
			Lb/acre		Pct
114----------------- Trail	Desert Sand-------------------	Favorable	650	Indian ricegrass-------------	30
		Normal	500	Fourwing saltbush------------	10
		Unfavorable	350	Spike dropseed---------------	10
				Sand dropseed----------------	5
				Needleandthread--------------	5
				Mormon-tea-------------------	5
				Sand sagebrush---------------	5
115*:					
Travessilla-------	Semidesert Shallow Sandy Loam.	Favorable	500	Galleta----------------------	20
		Normal	300	Shadscale--------------------	15
		Unfavorable	100	Indian ricegrass-------------	10
				Bigelow sagebrush------------	10
				Needleandthread--------------	5
				Mormon-tea-------------------	5
				Broom snakeweed--------------	5
Badland.					
Rock outcrop.					
116*:					
Travessilla-------	Semidesert Shallow Sandy Loam	Favorable	500	Galleta----------------------	20
		Normal	300	Shadscale--------------------	15
		Unfavorable	100	Indian ricegrass-------------	10
				Bigelow sagebrush------------	10
				Needleandthread--------------	5
				Mormon-tea-------------------	5
				Broom snakeweed--------------	5
Rock outcrop.					
117*:					
Wayneco-----------	Semidesert Shallow Sandy Loam (Blackbrush).	Favorable	500	Blackbrush-------------------	65
		Normal	350	Indian ricegrass-------------	5
		Unfavorable	200	Galleta----------------------	5
				Torrey Mormon-tea------------	5
				Bigelow sagebrush------------	5
Mido--------------	Semidesert Sand---------------	Favorable	800	Indian ricegrass-------------	20
		Normal	600	Needleandthread--------------	10
		Unfavorable	300	Fourwing saltbush------------	10
				Mormon-tea-------------------	5
				Galleta----------------------	5
				Dropseed---------------------	5
				Sandhill muhly---------------	5
				Sand sagebrush---------------	5
118*:					
Wayneco-----------	Semidesert Shallow Sandy Loam (Blackbrush).	Favorable	500	Blackbrush-------------------	65
		Normal	350	Indian ricegrass-------------	5
		Unfavorable	200	Galleta----------------------	5
				Torrey Mormon-tea------------	5
				Bigelow sagebrush------------	5
Milok-------------	Semidesert Sandy Loam (Blackbrush).	Favorable	700	Indian ricegrass-------------	20
		Normal	500	Blackbrush-------------------	15
		Unfavorable	300	Galleta----------------------	10
				Mormon-tea-------------------	10
				Sand dropseed----------------	5
				Needleandthread--------------	5
				Fourwing saltbush------------	5
Rock outcrop.					

See footnote at end of table.

TABLE 4.--RANGELAND AND WOODLAND UNDERSTORY PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Grazing Site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo-sition
			Lb/acre		Pct
119*:					
Wayneco	Semidesert Shallow Sandy Loam (Blackbrush).	Favorable	500	Blackbrush	65
		Normal	350	Indian ricegrass	5
		Unfavorable	200	Galleta	5
				Torrey Mormon-tea	5
				Bigelow sagebrush	5
Rizno	Semidesert Very Shallow Sandy Loam (Blackbrush).	Favorable	325	Blackbrush	70
		Normal	250	Galleta	10
		Unfavorable	150	Mormon-tea	5
Rock outcrop.					
120*:					
Windwhistle	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Mormon-tea	5
				Winterfat	5
Rock outcrop.					
121, 122 Yarts	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Mormon-tea	5
				Winterfat	5
123*, 124*:					
Yarts	Semidesert Sandy Loam	Favorable	700	Indian ricegrass	20
		Normal	500	Needleandthread	15
		Unfavorable	300	Galleta	10
				Fourwing saltbush	10
				Mormon-tea	5
				Winterfat	5
Mido	Semidesert Sand	Favorable	800	Indian ricegrass	20
		Normal	600	Needleandthread	10
		Unfavorable	300	Fourwing saltbush	10
				Mormon-tea	5
				Galleta	5
				Dropseed	5
				Sandhill muhly	5
				Sand sagebrush	5

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 5.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
1*. Badland						
2*:						
Badland.						
Hanksville	Severe: excess salt.	Severe: excess salt.	Slight	Severe: depth to rock, percs slowly.	Severe: low strength, shrink-swell.	Severe: shrink-swell.
3*:						
Badland.						
Rock outcrop.						
4, 5 Begay	Slight	Slight	Severe: erodes easily.	Slight	Slight	Slight.
6*:						
Begay	Slight	Slight	Severe: erodes easily.	Slight	Slight	Slight.
Mellenthin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
7*:						
Begay	Slight	Slight	Severe: erodes easily.	Slight	Slight	Slight.
Mido	Moderate: slope.	Moderate: slope.	Severe: erodes easily.	Severe: poor filter.	Moderate: slope.	Moderate: slope.
8*:						
Begay	Slight	Slight	Severe: erodes easily.	Slight	Slight	Slight.
Rizno	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
9-------------------- Billings	Severe: flooding, excess sodium, excess salt.	Severe: excess sodium, excess salt.	Severe: erodes easily.	Severe: percs slowly.	Severe: low strength, frost action.	Severe: flooding.
10------------------- Billings	Moderate: excess salt.	Moderate: excess salt.	Severe: erodes easily.	Severe: percs slowly.	Severe: low strength, frost action.	Moderate: shrink-swell.
11------------------- Billings	Severe: flooding, excess sodium, excess salt.	Severe: excess sodium, excess salt.	Severe: erodes easily.	Severe: percs slowly.	Severe: low strength, frost action.	Severe: flooding.
12------------------- Billings Variant	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.	Severe: percs slowly.	Severe: low strength, shrink-swell.	Severe: shrink-swell.
13------------------- Blackston	Slight---------	Slight---------	Slight---------	Severe: poor filter.	Moderate: large stones.	Moderate: large stones.
14------------------- Blackston	Moderate: small stones.	Moderate: small stones.	Slight---------	Severe: poor filter.	Moderate: large stones.	Moderate: large stones.
15------------------- Blackston	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: poor filter, slope.	Severe: slope.	Severe: slope.
16*:						
Blackston------------	Moderate: small stones.	Moderate: small stones.	Slight---------	Severe: poor filter.	Moderate: large stones.	Moderate: large stones.
Leebench-------------	Severe: excess sodium.	Severe: excess sodium.	Slight---------	Severe: percs slowly.	Severe: low strength.	Moderate: shrink-swell.
17------------------- Bowdish	Slight---------	Slight---------	Slight---------	Severe: depth to rock.	Moderate: frost action.	Slight.
18*:						
Bowdish--------------	Slight---------	Slight---------	Slight---------	Severe: depth to rock.	Moderate: frost action.	Slight.
Mido-----------------	Slight---------	Slight---------	Severe: erodes easily.	Severe: poor filter.	Slight---------	Slight.

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
19---------- Bowdish Variant	Slight----------	Slight----------	Slight----------	Moderate: depth to rock, percs slowly.	Moderate: frost action, shrink-swell.	Moderate: shrink-swell.
20*:						
Canyon family--------	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
21*:						
Cerrillos------------	Moderate: slope, large stones, small stones.	Moderate: slope, large stones, small stones.	Moderate: large stones, dusty.	Severe: percs slowly.	Severe: low strength.	Moderate: shrink-swell, slope.
Chipeta--------------	Severe: depth to rock, excess salt.	Severe: excess salt, depth to rock.	Severe: erodes easily.	Severe: depth to rock.	Severe: low strength.	Moderate: shrink-swell, slope, depth to rock.
22---------- Cerrillos Variant	Moderate: percs slowly, excess salt.	Moderate: excess salt, percs slowly.	Slight----------	Severe: depth to rock, percs slowly.	Severe: low strength.	Moderate: shrink-swell, depth to rock.
23---------- Chipeta	Severe: depth to rock, excess salt.	Severe: excess salt, depth to rock.	Severe: erodes easily.	Severe: depth to rock.	Severe: low strength.	Moderate: shrink-swell, slope, depth to rock.
24---------- Chipeta	Severe: slope, depth to rock, excess salt.	Severe: slope, excess salt, depth to rock.	Severe: slope.	Severe: depth to rock, slope.	Severe: low strength, slope.	Severe: slope.
25*:						
Chipeta--------------	Severe: slope, depth to rock, excess salt.	Severe: slope, excess salt, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: low strength, slope.	Severe: slope.
Badland.						

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
26*:						
Chipeta Variant	Severe: slope.	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: low strength, slope.	Severe: slope.
Badland.						
Rock outcrop.						
27*:						
Circleville	Severe: slope.	Severe: slope.		Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
Blazon	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: large stones, slope.	Severe: depth to rock, slope.	Severe: low strength, slope.	Severe: slope.
28 Delson	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: percs slowly, slope.	Severe: low strength, slope.	Severe: slope.
29*:						
Delson	Severe: slope.	Severe: slope.	Severe: slope.	Severe: percs slowly, slope.	Severe: low strength, slope.	Severe: slope.
Datino family	Severe: slope.	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
30*:						
Delson	Severe: slope.	Severe: slope.	Severe: slope.	Severe: percs slowly, slope.	Severe: low strength, slope.	Severe: slope.
Makoti family	Severe: slope.	Severe: slope.	Severe: slope.	Severe: percs slowly, slope.	Severe: low strength, slope.	Severe: slope.
31*:						
Duneland.						

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
31*:						
Mido	Moderate: slope.	Moderate: slope.	Severe: erodes easily.	Severe: poor filter.	Moderate: slope.	Moderate: slope.
32 Factory	Slight	Slight	Slight	Severe: cemented pan.	Moderate: cemented pan, frost action.	Moderate: cemented pan.
33 Farb	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
34*:						
Farb	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop.						
35*:						
Farb	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Farb, very shallow	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
36* Glenberg family	Slight	Slight	Slight	Slight	Slight	Slight.
37*:						
Goblin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
Chipeta	Severe: slope, depth to rock, excess salt.	Severe: slope, excess salt, depth to rock.	Severe: erodes easily.	Severe: depth to rock, slope.	Severe: low strength, slope.	Severe: slope.
38*:						
Green River family	Severe: flooding, excess salt.	Severe: excess salt.	Moderate: wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
38*:						
Myton family extremely bouldery loam	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Myton family very gravelly sandy loam	Severe: small stones.	Severe: small stones.	Slight	Moderate: slope, large stones.	Moderate: slope, large stones.	Moderate: slope, large stones.
39*:						
Hanksville	Severe: excess salt.	Severe: excess salt.	Severe: erodes easily.	Severe: depth to rock, percs slowly.	Severe: low strength, shrink-swell.	Severe: shrink-swell.
Chipeta	Severe: depth to rock, excess salt.	Severe: excess salt, depth to rock.	Severe: erodes easily.	Severe: depth to rock.	Severe: low strength.	Moderate: shrink-swell, slope, depth to rock.
40 Haverdad	Severe: flooding.	Moderate: excess salt, dusty.	Severe: erodes easily.	Severe: flooding.	Severe: flooding.	Severe: flooding.
41 Jocity	Slight	Slight	Severe: erodes easily.	Severe: percs slowly.	Severe: low strength.	Moderate: shrink-swell.
42 Jocity	Moderate: percs slowly, too clayey.	Moderate: too clayey, percs slowly.	Slight	Severe: percs slowly.	Severe: low strength.	Moderate: shrink-swell.
43 Leebench	Severe: excess sodium, excess salt.	Severe: excess sodium, excess salt.	Slight	Severe: percs slowly.	Moderate: low strength, shrink-swell.	Moderate: shrink-swell.
44*:						
Leebench	Severe: excess sodium, excess salt.	Severe: excess sodium, excess salt.	Severe: erodes easily.	Severe: percs slowly.	Moderate: low strength, shrink-swell.	Moderate: shrink-swell.

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
44*:						
Hanksville	Severe: excess salt.	Severe: excess salt.	Severe: erodes easily.	Severe: depth to rock, percs slowly.	Severe: low strength, shrink-swell.	Severe: shrink-swell.
45*:						
Mellenthin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
Mido	Moderate: slope.	Moderate: slope.	Severe: erodes easily.	Severe: poor filter.	Moderate: slope.	Moderate: slope.
46 Mido	Moderate: slope.	Moderate: slope.	Severe: erodes easily.	Severe: poor filter.	Moderate: slope.	Moderate: slope.
47*:						
Mido	Moderate: slope.	Moderate: slope.	Severe: erodes easily.	Severe: poor filter.	Moderate: slope.	Moderate: slope.
Wayneco	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Milok	Slight	Slight	Slight	Slight	Slight	Slight.
48, 49 Milok	Slight	Slight	Slight	Slight	Slight	Slight.
50*:						
Milok	Slight	Slight	Slight	Slight	Slight	Slight.
Begay	Slight	Slight	Severe: erodes easily.	Slight	Slight	Slight.
51*:						
Milok	Slight	Slight	Slight	Slight	Slight	Slight.
Chipeta	Severe: slope, depth to rock, excess salt.	Severe: slope, excess salt, depth to rock.	Severe: erodes easily.	Severe: depth to rock, slope.	Severe: low strength, slope.	Severe: slope.

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
52*:						
Milok	Slight	Slight	Slight	Slight	Slight	Slight.
Mido	Moderate: slope.	Moderate: slope.	Severe: erodes easily.	Severe: poor filter.	Moderate: slope.	Moderate: slope.
53*:						
Milok	Slight	Slight	Slight	Slight	Slight	Slight.
Pastern	Severe: cemented pan.	Severe: cemented pan.	Slight	Severe: cemented pan.	Severe: cemented pan.	Severe: cemented pan.
54 Mivida	Slight	Slight	Severe: erodes easily.	Slight	Slight	Slight.
55*:						
Mivida	Slight	Slight	Severe: erodes easily.	Slight	Slight	Slight.
Goblin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
56 Mivida Variant	Severe: flooding, slope, large stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope.	Severe: slope.	Severe: slope.	Severe: flooding, slope.
57 Moenkopie	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
58*:						
Moenkopie	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Chipeta	Severe: depth to rock, excess salt.	Severe: excess salt, depth to rock.	Severe: erodes easily.	Severe: depth to rock.	Severe: low strength.	Moderate: shrink-swell, slope, depth to rock.
59*:						
Moenkopie fine sandy loam	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
59*:						
Moenkopie channery sandy loam	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
60 Moffat	Slight	Slight	Slight	Slight	Slight	Slight.
61 Moffat	Moderate: slope.	Moderate: slope.	Slight	Moderate: slope.	Moderate: slope.	Moderate: slope.
62*:						
Moffat	Slight	Slight	Slight	Slight	Slight	Slight.
Sheppard	Slight	Slight	Slight	Severe: poor filter.	Slight	Slight.
63* Montosa family	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones.
64 Monue	Slight	Slight	Slight	Slight	Slight	Slight.
65*:						
Monue Variant	Slight	Slight	Slight	Severe: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock.
Farb	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop.						
66*:						
Myton family	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Travessilla	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
66*: Rock outcrop.						
67*----------------- Olnes family	Severe: slope.	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
68*: Olnes family---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
Pando family---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
69*: Otero family---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
Glenberg family------	Severe: flooding.	Slight---------	Slight---------	Moderate: flooding.	Moderate: flooding.	Severe: flooding.
70----------------- Palma	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Slight---------	Slight---------	Slight.
71*: Pando family---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Rogert---------------	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
72----------------- Pastern	Severe: cemented pan.	Severe: cemented pan.	Slight---------	Severe: cemented pan.	Severe: cemented pan.	Severe: cemented pan.
73----------------- Pennell	Severe: depth to rock.	Severe: depth to rock.	Severe: erodes easily.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
74*: Pennell--------------	Severe: depth to rock.	Severe: depth to rock.	Severe: erodes easily.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
74*:						
Moenkopie	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop.						
75*:						
Pennell	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Moenkopie	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
76*:						
Redcreek	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Windwhistle Variant	Slight	Slight	Slight	Severe: depth to rock.	Moderate: depth to rock, frost action.	Moderate: depth to rock.
77*. Riverwash						
78*:						
Riverwash.						
Glenberg family	Severe: flooding.	Slight	Slight	Moderate: flooding.	Moderate: flooding.	Severe: flooding.
Green River family	Severe: flooding, excess salt.	Severe: excess salt.	Moderate: wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
79*:						
Riverwash.						
Neskahi family	Slight	Slight	Slight	Moderate: percs slowly.	Slight	Slight.

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
80 Rizno	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
81*:						
Rizno	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Mido	Moderate: slope.	Moderate: slope.	Severe: erodes easily.	Severe: poor filter.	Moderate: slope.	Moderate: slope.
82*:						
Rizno	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
83*:						
Rizno	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop.						
84*:						
Robroost	Slight	Slight	Slight	Moderate: percs slowly.	Slight	Slight.
Goblin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
85*:						
Robroost	Moderate: slope.	Moderate: slope.	Slight	Moderate: percs slowly, slope.	Moderate: slope.	Moderate: slope.
Goblin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
86*. Rock outcrop						

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
87*: Rock outcrop.						
Arches	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
88*: Rock outcrop.						
Chipeta	Severe: depth to rock, excess salt.	Severe: excess salt, depth to rock.	Severe: erodes easily.	Severe: depth to rock.	Severe: low strength.	Moderate: shrink-swell, slope, depth to rock.
89*: Rock outcrop.						
Chipeta	Severe: slope, depth to rock, excess salt.	Severe: slope, excess salt, depth to rock.	Severe: erodes easily.	Severe: depth to rock, slope.	Severe: low strength, slope.	Severe: slope.
Canyon family	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
90*: Rock outcrop.						
Farb	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
91*: Rock outcrop.						
Montosa family	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
92*: Rock outcrop.						
Stormitt	Severe: small stones.	Severe: small stones.	Moderate: large stones, dusty.	Severe: large stones.	Severe: large stones.	Severe: large stones.
Rizno	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
93*, 94*: Rock outcrop.						
Travessilla	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
95*: Rogert	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rogert Variant	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
96*. Rubble land						
97*: Shedado loamy fine sand	Moderate: slope.	Moderate: slope.	Severe: erodes easily.	Severe: depth to rock.	Moderate: depth to rock. slope.	Moderate: slope, depth to rock.
Shedado fine sandy loam	Moderate: slope.	Moderate: slope.	Slight	Severe: depth to rock.	Moderate: depth to rock, slope.	Moderate: slope, depth to rock.
98 Sheppard	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: poor filter.	Slight	Slight.

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
99------------------- Sheppard	Slight---------	Slight---------	Slight---------	Severe: poor filter.	Slight---------	Slight.
100*:						
Sheppard-------------	Slight---------	Slight---------	Slight---------	Severe: poor filter.	Slight---------	Slight.
Goblin---------------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
101*:						
Sheppard-------------	Slight---------	Slight---------	Slight---------	Severe: poor filter.	Slight---------	Slight.
Leebench-------------	Severe: excess sodium, excess salt.	Severe: excess sodium, excess salt.	Severe: erodes easily.	Severe: percs slowly.	Moderate: low strength, shrink-swell.	Moderate: shrink-swell.
102*:						
Sheppard-------------	Slight---------	Slight---------	Slight---------	Severe: poor filter.	Slight---------	Slight.
Moenkopie------------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
103*:						
Sheppard-------------	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: poor filter.	Slight---------	Slight.
Moenkopie------------	Severe: depth to rock.	Severe: depth to rock.	Slight---------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
104*:						
Sheppard-------------	Moderate: slope.	Moderate: slope.	Slight---------	Severe: poor filter.	Moderate: slope.	Moderate: slope.
Pennell--------------	Severe: depth to rock.	Severe: depth to rock.	Severe: erodes easily.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop.						

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
105*:						
Sheppard	Slight	Slight	Slight	Severe: poor filter.	Slight	Slight.
Rock outcrop.						
106 Stormitt	Moderate: slope, small stones, dusty.	Moderate: slope, small stones, dusty.	Moderate: dusty.	Severe: large stones.	Severe: large stones.	Severe: large stones.
107 Stormitt	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
108*:						
Stormitt	Severe: slope.	Severe: slope.	Moderate: dusty.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Rizno	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
109 Strych	Moderate: slope.	Moderate: slope.	Slight	Moderate: slope, large stones.	Moderate: slope, frost action, large stones.	Moderate: slope, large stones.
110*:						
Tolman	Severe: slope, large stones, depth to rock.	Severe: slope, large stones, depth to rock.	Severe: slope.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: slope, depth to rock, large stones.
Rock outcrop.						
111 Trachute	Slight	Slight	Slight	Slight	Slight	Slight.
112*:						
Trachute	Slight	Slight	Slight	Slight	Slight	Slight.

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
112*:						
Goblin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
113*:						
Trachute	Slight	Slight	Slight	Slight	Slight	Slight.
Sheppard	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: poor filter.	Slight	Slight.
114 Trail	Slight	Slight	Slight	Severe: poor filter.	Slight	Slight.
115*:						
Travessilla	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Badland.						
Rock outcrop.						
116*:						
Travessilla	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock,	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop.						
117*:						
Wayneco	Severe: too sandy, depth to rock.	Severe: too sandy, depth to rock.	Severe: too sandy.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Mido	Moderate: slope.	Moderate: slope.	Severe: erodes easily.	Severe: poor filter.	Moderate: slope.	Moderate: slope.
118*:						
Wayneco	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Milok	Slight	Slight	Slight	Slight	Slight	Slight.
Rock outcrop.						

See footnote at end of table.

TABLE 5.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Paths and trails	Septic tank absorption fields	Local roads and streets	Dwellings without basements
119*:						
Wayneco	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rizno	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
120*:						
Windwhistle	Slight	Slight	Severe: erodes easily.	Severe: depth to rock, poor filter.	Moderate: frost action.	Slight.
Rock outcrop.						
121, 122 Yarts	Slight	Slight	Slight	Slight	Moderate: frost action.	Slight.
123*:						
Yarts	Slight	Slight	Slight	Moderate: depth to rock.	Moderate: frost action.	Slight.
Mido	Slight	Slight	Severe: erodes easily.	Severe: poor filter.	Slight	Slight.
124*:						
Yarts	Slight	Slight	Slight	Moderate: depth to rock.	Moderate: frost action.	Slight.
Mido	Moderate: slope.	Moderate: slope.	Severe: erodes easily.	Severe: poor filter.	Moderate: slope.	Moderate: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1*. Badland				
2*: Badland.				
Hanksville	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt.
3*: Badland.				
Rock outcrop.				
4 Begay	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
5 Begay	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
6*: Begay	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Mellenthin	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, large stones, slope.
7*: Begay	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Mido	Good	Probable	Improbable: too sandy.	Poor: thin layer.
8*: Begay	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Rizno	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
9 Billings	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, excess sodium.
10 Billings	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, excess salt.
11 Billings	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, excess sodium.

See footnote at end of table.

TABLE 6.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
12: Billings Variant	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
13, 14: Blackston	Fair: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: small stones, area reclaim.
15: Blackston	Fair: large stones, slope.	Improbable: large stones.	Improbable: large stones.	Poor: small stones, area reclaim, slope.
16*:				
Blackston	Fair: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: small stones, area reclaim.
Leebench	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, excess sodium.
17: Bowdish	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too sandy, small stones.
18*:				
Bowdish	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too sandy, small stones.
Mido	Good	Probable	Improbable: too sandy.	Poor: thin layer.
19: Bowdish Variant	Fair: area reclaim, thin layer, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
20*:				
Canyon family	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Rock outcrop.				
21*:				
Cerrillos	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
Chipeta	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, excess salt.
22: Cerrillos Variant	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, excess salt, thin layer.

See footnote at end of table.

TABLE 6.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
23------ Chipeta	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, excess salt.
24------ Chipeta	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, excess salt.
25*:				
Chipeta------	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, excess salt.
Badland.				
26*:				
Chipeta Variant------	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Badland.				
Rock outcrop.				
27*:				
Circleville------	Poor: depth to rock.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, slope.
Blazon------	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, large stones, slope.
28------ Delson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
29*:				
Delson------	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Datino family------	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
30*:				
Delson------	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Makoti family------	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

See footnote at end of table.

TABLE 6.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
31*:				
Duneland.				
Mido	Good	Probable	Improbable: too sandy.	Poor: thin layer.
32 Factory	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
33 Farb	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
34*:				
Farb	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Rock outcrop.				
35*:				
Farb	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Farb, very shallow	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Rock outcrop.				
36* Glenberg family	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
37*:				
Goblin	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Chipeta	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, excess salt.
38*:				
Green River family	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt.
Myton family extremely bouldery loam	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Myton family very gravelly sandy loam	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
39*:				
Hanksville	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt.

See footnote at end of table.

TABLE 6.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
39*:				
Chipeta	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, excess salt.
40 Haverdad	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: excess salt, thin layer.
41 Jocity	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
42 Jocity	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
43 Leebench	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, excess salt, excess sodium.
44*:				
Leebench	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, excess sodium.
Hanksville	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt.
45*:				
Mellenthin	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, large stones, slope.
Rock outcrop.				
Mido	Good	Probable	Improbable: too sandy.	Poor: thin layer.
46 Mido	Good	Probable	Improbable: too sandy.	Poor: thin layer.
47*:				
Mido	Good	Probable	Improbable: too sandy.	Poor: thin layer.
Wayneco	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Milok	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, area reclaim.
48 Milok	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, area reclaim.

See footnote at end of table.

TABLE 6.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
49: Milok	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim.
50*:				
Milok	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, area reclaim.
Begay	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
51*:				
Milok	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, area reclaim.
Chipeta	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, excess salt.
52*:				
Milok	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, area reclaim.
Mido	Good	Probable	Improbable: too sandy.	Poor: thin layer.
53*:				
Milok	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, area reclaim.
Pastern	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
54: Mivida	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, area reclaim.
55*:				
Mivida	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, area reclaim.
Goblin	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
56: Mivida Variant	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
57: Moenkopie	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
58*:				
Moenkopie	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.

See footnote at end of table.

TABLE 6.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
58*:				
Chipeta	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, excess salt.
59*:				
Moenkopie fine sandy loam	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Moenkopie channery sandy loam	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Rock outcrop.				
60 Moffat	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
61 Moffat	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones, slope.
62*:				
Moffat	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
Sheppard	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
63* Montosa family	Poor: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: small stones, area reclaim.
64 Monue	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
65*:				
Monue Variant	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer.
Farb	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Rock outcrop.				
66*:				
Myton family	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Travessilla	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.

See footnote at end of table.

TABLE 6.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
66*: Rock outcrop.				
67*----------------- Olnes family	Poor: area reclaim, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones, slope.
68*: Olnes family---------	Poor: area reclaim, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones, slope.
Pando family---------	Poor: large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, area reclaim, slope.
69*: Otero family---------	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
Glenberg family------	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
70------------------- Palma	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
71*: Pando family---------	Poor: large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, area reclaim, slope.
Rogert---------------	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
72------------------- Pastern	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
73------------------- Pennell	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
74*: Pennell--------------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
Moenkopie------------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Rock outcrop.				
75*: Pennell--------------	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.

See footnote at end of table.

TABLE 6.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
75*:				
Moenkopie	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Rock outcrop.				
76*:				
Redcreek	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Windwhistle Variant	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones, thin layer.
77*. Riverwash				
78*:				
Riverwash.				
Glenberg family	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
Green River family	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt.
79*:				
Riverwash.				
Neskahi family	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
80 Rizno	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
81*:				
Rizno	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
Mido	Good	Probable	Improbable: too sandy.	Poor: thin layer.
82*:				
Rizno	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Rock outcrop.				
83*:				
Rizno	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
Rock outcrop.				
84*:				
Robroost	Good	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

TABLE 6.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
84*:				
Goblin	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
85*:				
Robroost	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
Goblin	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
86*.				
Rock outcrop				
87*:				
Rock outcrop.				
Arches	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
88*:				
Rock outcrop.				
Chipeta	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, excess salt.
89*:				
Rock outcrop.				
Chipeta	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, excess salt.
Canyon family	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
90*:				
Rock outcrop.				
Farb	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
91*:				
Rock outcrop.				
Montosa family	Poor: large stones, slope.	Improbable: large stones.	Improbable: large stones.	Poor: small stones, area reclaim, slope.
92*:				
Rock outcrop.				

See footnote at end of table.

TABLE 6.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
92*:				
Stormitt	Poor: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, area reclaim.
Rizno	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
93*, 94*: Rock outcrop.				
Travessilla	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
95*:				
Rogert	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Rogert Variant	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
96*. Rubble land				
97*:				
Shedado loamy fine sand	Poor: area reclaim.	Improbable: excess fines.	Improabable: excess fines.	Poor: thin layer.
Shedado fine sandy loam	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
98 Sheppard	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
99 Sheppard	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
100*:				
Sheppard	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
Goblin	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
101*:				
Sheppard	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
Leebench	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, excess sodium.

See footnote at end of table.

TABLE 6.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
102*:				
Sheppard	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
Moenkopie	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
103*:				
Sheppard	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
Moenkopie	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
104*:				
Sheppard	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones, slope.
Pennell	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
Rock outcrop.				
105*:				
Sheppard	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
Rock outcrop.				
106 Stormitt	Poor: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, area reclaim.
107 Stormitt	Poor: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, area reclaim, slope.
108*:				
Stormitt	Poor: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, area reclaim, slope.
Rizno	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
109 Strych	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 6.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
110*:				
Tolman	Poor: area reclaim, large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, large stones, slope.
Rock outcrop.				
111 Trachute	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
112*:				
Trachute	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Goblin	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
113*:				
Trachute	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Sheppard	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
114 Trail	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
115*:				
Travessilla	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Badland.				
Rock outcrop.				
116*:				
Travessilla	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
Rock outcrop.				
117*:				
Wayneco	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too sandy.
Mido	Good	Probable	Improbable: too sandy.	Poor: thin layer.
118*:				
Wayneco	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Milok	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, area reclaim.
Rock outcrop.				

See footnote at end of table.

TABLE 6.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
119*:				
Wayneco	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Rizno	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Rock outcrop.				
120*:				
Windwhistle	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too sandy, thin layer.
Rock outcrop.				
121, 122 Yarts	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
123*, 124*:				
Yarts	Fair: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
Mido	Good	Probable	Improbable: too sandy.	Poor: thin layer.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1*. Badland											
2*: Badland.											
Hanksville	0-3	Gravelly clay loam.	CL, SC	A-6, A-7	0	80-90	55-75	50-70	40-55	35-45	15-25
	3-35	Clay loam, silty clay.	CL	A-6, A-7	0	100	100	90-100	80-95	35-45	15-25
	35	Weathered bedrock	---	---	---	---	---	---	---	---	---
3*: Badland.											
Rock outcrop.											
4 Begay	0-5	Loamy fine sand	SM	A-2, A-4	0	100	100	75-90	30-50	---	NP
	5-60	Very fine sandy loam, fine sandy loam, sandy loam.	ML, CL-ML	A-4	0	100	100	80-95	50-65	20-30	NP-10
5 Begay	0-3	Fine sandy loam	SM	A-4	0	100	100	70-85	40-50	20-25	NP-5
	3-30	Very fine sandy loam, fine sandy loam, sandy loam.	ML, CL-ML	A-4	0	100	100	80-95	50-65	20-30	NP-10
	30-60	Very fine sandy loam, loamy fine sand, fine sandy loam.	ML, SM	A-4, A-2	0	100	100	75-95	30-60	---	NP
6*: Begay	0-3	Loamy fine sand	SM	A-2, A-4	0	100	100	75-90	30-50	---	NP
	3-14	Very fine sandy loam, fine sandy loam, sandy loam.	ML, CL-ML	A-4	0	100	100	80-95	50-65	20-30	NP-10
	14-60	Very fine sandy loam, loamy fine sand, fine sandy loam.	ML, SM	A-4, A-2	0	100	100	75-95	30-60	---	NP
Mellenthin	0-3	Gravelly fine sandy loam.	SM	A-4, A-2	0-15	70-85	60-75	50-65	30-45	20-25	NP-5
	3-16	Very channery fine sandy loam.	SM, GM	A-2	10-15	60-70	50-60	40-50	25-35	20-25	NP-5
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
7*: Begay	0-3	Loamy fine sand	SM	A-2, A-4	0	100	100	75-90	30-50	---	NP
	3-14	Very fine sandy loam, fine sandy loam, sandy loam.	ML, CL-ML	A-4	0	100	100	80-95	50-65	20-30	NP-10
	14-60	Very fine sandy loam, loamy fine sand, fine sandy loam.	ML, SM	A-4, A-2	0	100	100	75-95	30-60	---	NP

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
7*:											
Mido------------	0-30	Loamy fine sand	SM	A-2, A-4	0	100	100	75-95	30-50	---	NP
	30-60	Loamy fine sand, fine sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-35	---	NP
8*:											
Begay-----------	0-3	Loamy fine sand	SM	A-2, A-4	0	100	100	75-90	30-50	---	NP
	3-20	Very fine sandy loam, fine sandy loam, sandy loam.	ML, CL-ML	A-4	0	100	100	80-95	50-65	20-30	NP-10
	20-60	Very fine sandy loam, loamy fine sand, fine sandy loam.	ML, SM	A-4, A-2	0	100	100	75-95	30-60	---	NP
Rizno-----------	0-3	Fine sandy loam	SM, SM-SC	A-4, A-2	0-10	95-100	90-100	65-85	30-50	20-30	NP-10
	3-17	Fine sandy loam, sandy loam.	SM, SM-SC	A-4, A-2	0-10	95-100	90-100	65-85	30-50	20-30	NP-10
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
9--------------- Billings	0-1	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	70-90	25-35	5-15
	1-60	Silty clay loam, clay loam.	CL	A-6	0	100	100	95-100	75-90	25-40	10-20
10-------------- Billings	0-5	Silty clay loam	CL	A-6	0	100	100	95-100	90-95	30-40	10-20
	5-60	Silty clay loam, clay loam.	CL	A-6	0	100	100	95-100	90-95	30-40	10-20
11-------------- Billings	0-6	Silty clay loam	CL	A-6	0	100	100	95-100	85-95	30-40	10-20
	6-40	Silty clay loam, clay loam.	CL	A-6	0	100	100	95-100	75-90	25-40	10-20
	40-60	Stratified clay loam to very fine sandy loam.	CL, CL-ML	A-4, A-6	0	100	100	90-100	50-80	20-40	5-20
12-------------- Billings Variant	0-8	Clay-------------	CL	A-7	0	100	100	90-100	75-90	20-45	20-25
	8-60	Clay-------------	CL	A-7	0	100	100	90-100	75-90	40-50	20-30
13-------------- Blackston	0-5	Fine sandy loam	SM	A-2, A-4	0-5	80-100	75-100	65-90	25-40	15-25	NP-5
	5-27	Very cobbly clay loam, very cobbly loam.	SC, GC	A-6, A-2	30-50	60-80	50-70	40-60	30-50	30-35	10-15
	27-60	Extremely cobbly loamy sand.	GM, GP-GM	A-1	50-60	40-50	30-40	25-35	5-15	---	NP
14, 15---------- Blackston	0-4	Gravelly fine sandy loam.	SM, GM	A-2	0-5	65-85	55-75	40-60	25-35	15-25	NP-5
	4-25	Very cobbly clay loam, very cobbly loam.	SC, GC	A-6, A-2	30-50	60-80	50-70	40-60	30-50	30-35	10-15
	25-60	Extremely cobbly loamy sand.	GM, GP-GM	A-1	50-60	40-50	30-40	25-35	5-15	---	NP
16*:											
Blackston-------	0-4	Gravelly fine sandy loam.	SM, GM	A-2	0-5	65-85	55-75	40-60	25-35	15-25	NP-5
	4-25	Very cobbly clay loam, very cobbly loam.	SC, GC	A-6, A-2	30-50	60-80	50-70	40-60	30-50	30-35	10-15
	25-60	Extremely cobbly loamy sand.	GM, GP-GM	A-1	50-60	40-50	30-40	25-35	5-15	---	NP

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
16*:											
Leebench--------	0-3	Fine sandy loam	CL-ML, SM-SC	A-4	0	100	85-100	70-85	40-55	20-30	5-10
	3-42	Clay loam, gravelly clay loam.	CL	A-6	0	100	70-100	65-95	60-80	30-40	10-15
	42-60	Extremely gravelly sandy loam.	GM-GC	A-2	0-10	30-50	15-30	10-20	10-15	20-25	5-10
17--------------- Bowdish	0-2	Loamy fine sand	SM	A-4, A-2	0	100	100	85-95	30-40	---	NP
	2-14	Sandy loam, loam	SM-SC, CL-ML	A-2, A-4	0	100	100	60-85	30-60	20-25	5-10
	14-30	Channery loam----	SM-SC, CL-ML	A-4	0	70-85	60-75	50-65	35-55	25-30	5-10
	30	Weathered bedrock	---	---	---	---	---	---	---	---	---
18*:											
Bowdish---------	0-4	Loamy fine sand	SM	A-4, A-2	0	100	100	85-95	30-40	---	NP
	4-35	Sandy loam, loam	SM-SC, CL-ML	A-2, A-4	0	100	100	60-85	30-60	20-25	5-10
	35-39	Channery loam----	SM-SC, CL-ML	A-4	0	70-85	60-75	50-65	35-55	25-30	5-10
	39	Weathered bedrock	---	---	---	---	---	---	---	---	---
Mido------------	0-30	Loamy fine sand	SM	A-2, A-4	0	100	100	75-95	30-50	---	NP
	30-60	Loamy fine sand, fine sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-35	---	NP
19--------------- Bowdish Variant	0-3	Fine sandy loam	SM-SC	A-4	0	95-100	85-100	70-85	40-50	20-25	5-10
	3-20	Loam-------------	CL-ML	A-4	0	95-100	90-100	85-95	60-75	25-30	5-10
	20-44	Loam, sandy clay loam.	CL-ML, SM-SC, SM, ML	A-4	0	90-100	90-100	70-85	35-70	25-35	5-10
	44	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
20*:											
Canyon family---	0-4	Very stony loam	SM-SC, GM-GC	A-2, A-4	20-40	50-80	40-75	35-60	25-45	25-35	5-10
	4-18	Clay loam--------	CL, ML	A-6	0	80-100	75-100	70-95	60-80	35-40	10-15
	18	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
21*:											
Cerrillos-------	0-4	Cobbly loam------	CL	A-6	20-30	75-85	70-80	65-75	50-60	30-40	10-15
	4-11	Clay loam--------	CL	A-6, A-7	0-5	95-100	90-100	85-95	65-80	35-45	15-20
	11-60	Clay loam--------	CL	A-6, A-7	0-5	95-100	90-100	85-95	65-80	35-45	15-20
Chipeta---------	0-1	Silty clay-------	CL, ML	A-6, A-7	0	100	100	95-100	90-95	35-45	10-20
	1-19	Silty clay loam, silty clay, clay.	CL	A-6, A-7	0	100	100	95-100	90-95	35-45	15-20
	19	Weathered bedrock	---	---	---	---	---	---	---	---	---
22--------------- Cerrillos Variant	0-2	Loam-------------	CL-ML	A-4	0	100	100	85-95	60-75	20-30	5-10
	2-24	Clay loam--------	CL	A-6	0	100	100	90-100	70-80	30-40	10-15
	24-36	Loam-------------	CL-ML	A-4	0	100	100	85-95	60-75	20-30	5-10
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
23 Chipeta	0-1	Silty clay	CL, ML	A-6, A-7	0	100	100	95-100	90-95	35-45	10-20
	1-19	Silty clay loam, silty clay, clay.	CL	A-6, A-7	0	100	100	95-100	90-95	35-45	15-20
	19	Weathered bedrock	---	---	---	---	---	---	---	---	---
24 Chipeta	0-3	Gravelly silty clay.	CL	A-6	0	70-90	60-80	60-75	55-70	35-40	15-20
	3-15	Silty clay loam, silty clay, clay.	CL	A-6, A-7	0	100	100	95-100	90-95	35-45	15-20
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---
25*: Chipeta	0-3	Gravelly silty clay.	CL	A-6	0	70-90	60-80	60-75	55-70	35-40	15-20
	3-12	Silty clay loam, silty clay, clay.	CL	A-6, A-7	0	100	100	95-100	90-95	35-45	15-20
	12	Weathered bedrock	---	---	---	---	---	---	---	---	---
Badland.											
26*: Chipeta Variant	0-9	Clay loam	CL	A-6	0	90-100	85-100	85-95	70-80	25-30	10-15
	9-22	Cobbly silty clay loam.	CL	A-6	15-25	100	75-95	70-90	65-85	30-40	10-15
	22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Badland.											
Rock outcrop.											
27*: Circleville	0-4	Cobbly loam	CL-ML	A-4	15-30	85-95	80-90	65-80	50-70	25-35	5-10
	4-12	Very gravelly clay loam, very gravelly loam, very cobbly clay loam.	GM-GC, GC, CL-ML, CL	A-4, A-6	10-45	55-70	50-65	45-60	35-55	25-40	5-15
	12-36	Very cobbly loam, very gravelly loam, very cobbly sandy loam.	GM-GC, GM	A-4, A-2	20-55	55-65	50-60	35-55	20-45	20-30	NP-10
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Blazon	0-4	Cobbly clay loam	CL, GC	A-6	15-30	70-80	65-75	55-70	45-60	30-40	10-20
	4-11	Clay loam	CL	A-6	0-5	100	100	90-100	70-85	30-40	10-20
	11	Weathered bedrock	---	---	---	---	---	---	---	---	---
28 Delson	0-15	Cobbly loam	CL-ML	A-4	15-25	85-95	70-90	65-80	50-65	20-30	5-10
	15-40	Cobbly clay	CL	A-6, A-7	15-25	75-85	70-80	65-80	50-70	35-50	15-30
	40-60	Very cobbly clay	CL	A-6, A-7	40-50	75-85	65-80	60-80	50-70	35-50	15-30
29*: Delson	0-15	Cobbly loam	CL-ML	A-4	15-25	85-95	70-90	65-80	50-65	20-30	5-10
	15-40	Cobbly clay	CL	A-6, A-7	15-25	75-85	70-80	65-80	50-70	35-50	15-30
	40-60	Very cobbly clay	CL	A-6, A-7	40-50	75-85	65-80	60-80	50-70	35-50	15-30

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
29*:											
Datino family	0-10	Loam	CL-ML	A-4	0-5	100	90-100	85-95	60-75	25-30	5-10
	10-21	Very gravelly clay loam, very gravelly silty clay loam.	GC	A-6, A-2	0-15	40-60	35-55	30-50	25-45	30-40	10-15
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
30*:											
Delson	0-16	Cobbly loam	CL-ML	A-4	15-25	85-95	70-90	65-80	50-65	20-30	5-10
	16-40	Cobbly clay	CL	A-6, A-7	15-25	75-85	70-80	65-80	50-70	35-50	15-30
	40-60	Very cobbly clay	CL	A-6, A-7	40-50	75-85	65-80	60-80	50-70	35-50	15-30
Makoti family	0-4	Clay loam	CL	A-6, A-7	0	95-100	90-100	90-95	70-80	30-45	10-20
	4-41	Silty clay loam	CL	A-6	0	95-100	95-100	95-100	85-95	30-40	10-20
	41	Weathered bedrock	---	---	---	---	---	---	---	---	---
31*:											
Duneland.											
Mido	0-2	Loamy fine sand	SM	A-2, A-4	0	100	100	75-95	30-50	---	NP
	2-60	Loamy fine sand, fine sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-35	---	NP
32 Factory	0-2	Sandy loam	SM	A-2, A-4	0-5	85-100	80-100	45-70	25-50	20-25	NP-5
	2-8	Fine sandy loam, gravelly fine sandy loam, gravelly loam.	SM, SM-SC, GM-GC, GM	A-2, A-4	0-5	60-95	55-90	35-75	25-50	20-30	NP-10
	8-29	Gravelly fine sandy loam, gravelly sandy loam, gravelly loam.	SM, SM-SC, GM-GC, GM	A-2, A-4, A-1	0-15	55-80	50-75	30-60	15-50	20-30	NP-10
	29	Indurated	---	---	---	---	---	---	---	---	---
33 Farb	0-2	Fine sandy loam	SM, SM-SC	A-4	0	85-95	80-90	60-70	35-50	15-25	NP-10
	2-17	Fine sandy loam	SM, SM-SC	A-4	0	85-95	80-90	60-70	35-50	15-25	NP-10
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
34*:											
Farb	0-1	Fine sandy loam	SM, SM-SC	A-4	0	85-95	80-90	60-70	35-50	15-25	NP-10
	1-19	Fine sandy loam	SM, SM-SC	A-4	0	85-95	80-90	60-70	35-50	15-25	NP-10
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
35*:											
Farb	0-3	Fine sandy loam	SM, SM-SC	A-4	0	85-95	80-90	60-70	35-50	15-25	NP-10
	3-14	Fine sandy loam	SM, SM-SC	A-4	0	85-95	80-90	60-70	35-50	15-25	NP-10
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Farb, very shallow	0-6	Channery sandy loam.	SM, SM-SC	A-2, A-1	0-5	65-85	60-75	35-50	20-35	15-25	NP-10
	6	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
36*---------------- Glenberg family	0-3	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0	100	100	70-90	40-60	20-25	NP-10
	3-23	Loam, fine sandy loam.	CL-ML, SM-SC	A-4	0	100	100	70-90	40-75	20-30	5-10
	23-60	Fine sandy loam, very fine sandy loam, loam.	CL-ML, ML, SM, SM-SC	A-4	0	100	100	70-90	40-75	20-25	NP-10
37*:											
Goblin----------	0-3	Loam-------------	CL-ML	A-4	0	95-100	90-100	80-95	55-75	20-30	5-10
	3-12	Loam, fine sandy loam, loamy very fine sand.	SM-SC, CL-ML, SM, ML	A-4	0	85-100	80-100	70-85	35-70	20-30	NP-10
	12	Weathered bedrock	---	---	---	---	---	---	---	---	---
Chipeta---------	0-1	Silty clay-------	CL, ML	A-6, A-7	0	100	100	95-100	90-95	35-45	10-20
	1-19	Silty clay loam, silty clay, clay.	CL	A-6, A-7	0	100	100	95-100	90-95	35-45	15-20
	19	Weathered bedrock	---	---	---	---	---	---	---	---	---
38*:											
Green River family----------	0-6	Loamy fine sand	SM, ML	A-4	0	100	100	85-95	35-55	---	NP
	6-20	Fine sandy loam, loam.	SM-SC, CL-ML	A-4	0	100	100	70-90	40-65	20-25	5-10
	20-40	Gravelly sandy loam, loam.	SM-SC, GM-GC	A-2, A-4	0-5	65-85	55-80	35-60	15-45	20-25	5-10
	40-60	Loam, fine sandy loam.	CL-ML, SM-SC	A-4	0	100	100	85-95	40-75	20-25	5-10
Myton family extremely bouldery loam-	0-6	Extremely bouldery loam.	GM-GC	A-2	40-65	40-60	35-45	30-40	25-35	25-35	5-10
	6-60	Very cobbly sandy loam, very gravelly sandy loam.	GM, SM	A-1	20-40	50-75	40-70	25-45	15-25	20-25	NP-5
Myton family very gravelly sandy loam----	0-6	Very gravelly sandy loam.	GM, SM	A-1	0-10	40-60	35-55	25-35	10-20	20-25	NP-5
	6-60	Very cobbly sandy loam, very gravelly sandy loam.	GM, SM	A-1	20-40	50-75	40-70	25-45	15-25	20-25	NP-5
39*:											
Hanksville------	0-7	Clay loam--------	CL	A-6, A-7	0	100	100	90-100	70-80	35-45	15-25
	7-39	Clay loam, silty clay.	CL	A-6, A-7	0	100	100	90-100	80-95	35-45	15-25
	39	Weathered bedrock	---	---	---	---	---	---	---	---	---
Chipeta---------	0-1	Silty clay-------	CL, ML	A-6, A-7	0	100	100	95-100	90-95	35-45	10-20
	1-19	Silty clay loam, silty clay, clay.	CL	A-6, A-7	0	100	100	95-100	90-95	35-45	15-20
	19	Weathered bedrock	---	---	---	---	---	---	---	---	---
40---------------- Haverdad	0-9	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	90-100	75-85	20-30	5-15
	9-21	Loam-------------	CL-ML, CL	A-4, A-6	0	100	100	85-95	60-75	25-35	5-15
	21-60	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	90-95	70-80	20-30	5-15

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
41---------------- Jocity	0-6	Loam--------------	CL-ML, ML	A-4	0	100	100	85-95	60-75	25-35	5-10
	6-44	Clay loam, loam	ML	A-6	0	100	100	90-100	70-80	35-40	10-15
	44-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	100	100	60-70	30-40	20-25	NP-5
42---------------- Jocity	0-13	Clay--------------	CL	A-7	0	100	100	90-100	75-95	40-50	20-25
	13-44	Clay loam, loam	ML	A-6	0	100	100	90-100	70-80	35-40	10-15
	44-60	Loam, clay loam	CL	A-6	0	100	100	85-95	60-80	30-35	10-15
43---------------- Leebench	0-3	Gravelly clay loam.	CL-ML, GM-GC, SM-SC	A-4	0	65-80	60-75	50-70	40-60	25-30	5-10
	3-8	Clay loam, loam, gravelly clay loam.	CL	A-6	0	80-100	75-100	70-95	60-80	30-40	10-15
	8-60	Loam, sandy clay loam, gravelly loam.	CL-ML, CL	A-4, A-6	0	80-100	75-100	65-90	50-70	25-40	5-15
44*:											
Leebench---------	0-3	Fine sandy loam	SM, SM-SC	A-4, A-2	0	100	85-100	60-75	30-50	20-30	NP-10
	3-60	Clay loam, gravelly clay loam. gravelly clay loam.	CL	A-6	0	80-100	70-100	65-95	60-80	30-40	10-15
Hanksville-------	0-2	Clay loam---------	CL	A-6, A-7	0	100	100	90-100	70-80	35-45	15-25
	2-39	Clay loam, silty clay.	CL	A-6, A-7	0	100	100	90-100	80-95	35-45	15-25
	39	Weathered bedrock	---	---	---	---	---	---	---	---	---
45*:											
Mellenthin-------	0-3	Gravelly fine sandy loam.	SM	A-4, A-2	0-15	70-85	60-75	50-65	30-45	20-25	NP-5
	3-16	Very channery fine sandy loam.	SM, GM	A-2	10-15	60-70	50-60	40-50	25-35	20-25	NP-5
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
Mido-------------	0-4	Loamy fine sand	SM	A-2, A-4	0	100	100	75-95	30-50	---	NP
	4-60	Loamy fine sand, fine sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-35	---	NP
46---------------- Mido	0-2	Loamy fine sand	SM	A-2, A-4	0	100	100	75-95	30-50	---	NP
	2-60	Loamy fine sand, fine sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-35	---	NP
47*:											
Mido-------------	0-30	Loamy fine sand	SM	A-2, A-4	0	100	100	75-95	30-50	---	NP
	30-60	Loamy fine sand, fine sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-35	---	NP
Wayneco----------	0-2	Fine sandy loam	SM	A-4	0	85-100	80-100	65-85	35-50	---	NP
	2-16	Fine sandy loam, loam.	SM, ML	A-4	0	85-100	80-100	60-95	40-60	15-20	NP-5
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
47*:											
Milok----------	0-3	Loamy fine sand	ML, SM	A-4	0	100	100	85-95	40-55	---	NP
	3-60	Fine sandy loam	SM-SC	A-4	0	100	100	70-85	40-50	20-30	5-10
48-------------- Milok	0-12	Loamy fine sand	ML, SM	A-4	0	100	100	85-95	40-55	---	NP
	12-47	Fine sandy loam	SM-SC	A-4	0	100	100	70-85	40-50	20-30	5-10
	47-60	Gravelly loamy sand.	SM	A-1	0	90-100	55-75	30-50	10-20	---	NP
49-------------- Milok	0-5	Sandy loam-------	SM-SC	A-2, A-4	0	100	100	60-70	30-40	20-30	5-10
	5-60	Fine sandy loam	SM-SC	A-4	0	100	100	70-85	40-50	20-30	5-10
50*:											
Milok----------	0-12	Loamy fine sand	ML, SM	A-4	0	100	100	85-95	40-55	---	NP
	12-60	Fine sandy loam	SM-SC	A-4	0	100	100	70-85	40-50	20-30	5-10
Begay----------	0-8	Loamy fine sand	SM	A-2, A-4	0	100	100	75-90	30-50	---	NP
	8-32	Very fine sandy loam, fine sandy loam, sandy loam.	ML, CL-ML	A-4	0	100	100	80-95	50-65	20-30	NP-10
	32-60	Very fine sandy loam, loamy fine sand, fine sandy loam.	ML, SM	A-4, A-2	0	100	100	75-95	30-60	---	NP
51*:											
Milok----------	0-2	Loamy fine sand	ML, SM	A-4	0	100	100	85-95	40-55	---	NP
	2-60	Fine sandy loam	SM-SC	A-4	0	100	100	70-85	40-50	20-30	5-10
Chipeta---------	0-3	Silty clay-------	CL, ML	A-6, A-7	0	100	100	95-100	90-95	35-45	10-20
	3-11	Silty clay loam, silty clay, clay.	CL	A-6, A-7	0	100	100	95-100	90-95	35-45	15-20
	11	Weathered bedrock	---	---	---	---	---	---	---	---	---
52*:											
Milok----------	0-3	Loamy fine sand	ML, SM	A-4	0	100	100	85-95	40-55	---	NP
	3-60	Fine sandy loam	SM-SC	A-4	0	100	100	70-85	40-50	20-30	5-10
Mido-----------	0-30	Loamy fine sand	SM	A-2, A-4	0	100	100	75-95	30-50	---	NP
	30-60	Loamy fine sand, fine sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-35	---	NP
53*:											
Milok----------	0-4	Loamy fine sand	ML, SM	A-4	0	100	100	85-95	40-55	---	NP
	4-60	Fine sandy loam	SM-SC	A-4	0	100	100	70-85	40-50	20-30	5-10
Pastern---------	0-5	Fine sandy loam	SM, SM-SC	A-2, A-4	0	100	95-100	70-85	30-45	20-30	NP-10
	5-12	Fine sandy loam, gravelly fine sandy loam, gravelly loam.	SM, SM-SC	A-2, A-4	0-10	75-100	70-100	50-85	20-50	20-30	NP-10
	12	Indurated--------	---	---	---	---	---	---	---	---	---
54-------------- Mivida	0-6	Loamy fine sand	SM	A-4, A-2	0	100	100	85-95	30-45	---	NP
	6-60	Fine sandy loam	SM, SM-SC, CL-ML, ML	A-2, A-4	0	90-100	90-100	55-85	30-55	20-30	NP-10
55*:											
Mivida----------	0-6	Loamy fine sand	SM	A-4, A-2	0	100	100	85-95	30-45	---	NP
	6-60	Fine sandy loam	SM, SM-SC, CL-ML, ML	A-2, A-4	0	90-100	90-100	55-85	30-55	20-30	NP-10

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
55*:											
Goblin----------	0-3	Loam-------------	CL-ML	A-4	0	95-100	90-100	80-95	55-75	20-30	5-10
	3-12	Loam, fine sandy loam, loamy very fine sand.	SM-SC, CL-ML, SM, ML	A-4	0	85-100	80-100	70-85	35-70	20-30	NP-10
	12	Weathered bedrock	---	---	---	---	---	---	---	---	---
56--------------- Mivida Variant	0-8	Very cobbly very fine sandy loam.	GM-GC, GM	A-2	40-55	50-60	45-55	40-55	25-35	20-30	NP-10
	8-15	Very fine sandy loam.	ML, CL-ML	A-4	0	90-100	90-100	75-90	50-65	20-30	NP-10
	15-48	Fine sandy loam	SM-SC, SM	A-4	0	90-100	90-100	70-85	35-50	20-30	NP-10
	48	Weathered bedrock	---	---	---	---	---	---	---	---	---
57--------------- Moenkopie	0-3	Fine sandy loam	SM-SC	A-4	0	95-100	85-100	70-85	40-50	20-25	5-10
	3-19	Sandy loam, fine sandy loam.	SM-SC, SM	A-2, A-4	0-5	80-100	75-100	45-70	25-40	15-25	NP-10
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
58*:											
Moenkopie-------	0-3	Fine sandy loam	SM-SC	A-4	0	95-100	85-100	70-85	40-50	20-25	5-10
	3-17	Sandy loam, fine sandy loam.	SM-SC, SM	A-2, A-4	0-5	80-100	75-100	45-70	25-40	15-25	NP-10
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Chipeta---------	0-2	Silty clay-------	CL, ML	A-6, A-7	0	100	100	95-100	90-95	35-45	10-20
	2-14	Silty clay loam, silty clay, clay.	CL	A-6, A-7	0	100	100	95-100	90-95	35-45	15-20
	14	Weathered bedrock	---	---	---	---	---	---	---	---	---
59*:											
Moenkopie fine sandy loam-----	0-3	Fine sandy loam	SM-SC	A-4	0	95-100	85-100	70-85	40-50	20-25	5-10
	3-14	Sandy loam, fine sandy loam.	SM-SC, SM	A-2, A-4	0-5	80-100	75-100	45-70	25-40	15-25	NP-10
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Moenkopie channery sandy loam----------	0-2	Channery sandy loam.	SM	A-1	0	55-80	50-75	25-40	10-25	---	NP
	2-9	Sandy loam, fine sandy loam.	SM-SC, SM	A-2, A-4	0-5	80-100	75-100	45-70	25-40	15-25	NP-10
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
60, 61----------- Moffat	0-2	Loamy fine sand	SM	A-4, A-2	0	90-100	85-100	65-90	25-40	---	NP
	2-60	Fine sandy loam, sandy loam.	SM, SM-SC	A-4, A-2	0	95-100	90-100	65-85	25-45	20-30	NP-10
62*:											
Moffat----------	0-2	Loamy fine sand	SM	A-4, A-2	0	90-100	85-100	65-90	25-40	---	NP
	2-14	Fine sandy loam, sandy loam.	SM, SM-SC	A-4, A-2	0	95-100	90-100	65-85	25-45	20-30	NP-10
	14-60	Loamy very fine sand, fine sandy loam, fine sand.	SM, SM-SC	A-4, A-2	0	100	100	75-90	30-50	15-25	NP-10

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
62*:											
Sheppard--------	0-3	Loamy fine sand	SM	A-2	0	100	100	65-80	25-35	---	NP
	3-60	Loamy fine sand, fine sand, loamy sand.	SM	A-2	0	100	90-100	70-80	15-25	---	NP
63*-------------- Montosa family	0-3	Cobbly very fine sandy loam.	SM, SM-SC	A-2, A-4	20-30	80-90	75-85	60-75	30-50	20-30	NP-10
	3-11	Very cobbly loam	SM-SC, GM-GC	A-2, A-4	35-40	50-70	45-65	40-55	30-40	25-35	5-10
	11-52	Very cobbly coarse sandy loam, extremely cobbly coarse sandy loam.	GP-GM, GM, GM-GC	A-1, A-2	50-60	40-55	30-50	15-35	10-20	20-30	NP-10
	52-60	Extremely cobbly loamy coarse sand.	SP-SM, SP, GP, GP-GM	A-1	50-60	30-55	25-50	15-25	0-10	---	NP
64--------------- Monue	0-3	Loamy fine sand	SM	A-4	0	100	100	85-95	35-50	---	NP
	3-60	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0	100	100	65-85	35-55	20-30	NP-10
65*:											
Monue Variant---	0-8	Fine sandy loam	SM	A-4	0	100	100	70-85	35-50	15-25	NP-5
	8-24	Fine sandy loam	SM-SC	A-4	0	100	100	70-85	35-50	20-30	5-10
	24-39	Loam-------------	CL-ML	A-4	0	100	100	80-90	60-70	20-30	5-10
	39	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Farb------------	0-3	Fine sandy loam	SM, SM-SC	A-4	0	85-95	80-90	60-70	35-50	15-25	NP-10
	3-12	Fine sandy loam	SM, SM-SC	A-4	0	85-95	80-90	60-70	35-50	15-25	NP-10
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
66*:											
Myton family----	0-6	Extremely bouldery loam.	GM-GC	A-2	40-65	40-60	35-45	30-40	25-35	25-35	5-10
	6-60	Very cobbly sandy loam, very gravelly sandy loam.	GM, SM	A-1	20-40	50-75	40-70	25-45	15-25	20-25	NP-5
Travessilla-----	0-3	Fine sandy loam	SM	A-2, A-4	0-5	90-100	90-100	60-80	30-50	15-25	NP-5
	3-12	Fine sandy loam, sandy loam, loam.	SM-SC, SM, CL-ML, ML	A-2, A-4	0-10	85-100	80-100	60-90	30-60	15-30	NP-10
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
67*-------------- Olnes family	0-6	Cobbly loam------	SM-SC, GM-GC	A-4	25-35	70-85	70-80	50-65	35-50	20-30	5-10
	6-36	Very cobbly loam, very gravelly loam.	GM-GC, SM-SC	A-2	15-45	50-65	40-60	30-40	25-30	20-30	5-10
	36-59	Extremely cobbly loam.	GM-GC	A-2	70-80	40-55	35-50	30-40	20-35	20-30	5-10
	59	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
68*:											
Olnes family----	0-6	Cobbly loam------	SM-SC, GM-GC	A-4	25-35	70-85	70-80	50-65	35-50	20-30	5-10
	6-36	Very cobbly loam, very gravelly loam.	GM-GC, SM-SC	A-2	15-45	50-65	40-60	30-40	25-30	20-30	5-10
	36-59	Extremely cobbly loam.	GM-GC	A-2	70-80	40-55	35-50	30-40	20-35	20-30	5-10
	59	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Pando family----	0-10	Cobbly loam------	CL-ML	A-4	20-40	75-90	70-90	60-80	50-65	20-30	5-10
	10-55	Very cobbly loam, very cobbly clay loam.	GM-GC, SM-SC, GC, SC	A-2, A-4, A-6	30-55	55-75	50-70	40-60	30-50	25-40	5-15
	55	Weathered bedrock	---	---	---	---	---	---	---	---	---
69*:											
Otero family----	0-5	Fine sandy loam	SM	A-4	0	100	100	70-85	40-50	20-25	NP-5
	5-60	Fine sandy loam	SM	A-4	0	100	100	70-85	40-50	20-25	NP-5
Glenberg family-	0-3	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0	100	100	70-90	40-60	20-25	NP-10
	3-23	Loam, fine sandy loam.	CL-ML, SM-SC	A-4	0	100	100	70-90	40-75	20-30	5-10
	23-60	Fine sandy loam, very fine sandy loam, loam.	CL-ML, ML, SM, SM-SC	A-4	0	100	100	70-90	40-75	20-25	NP-10
70--------------- Palma	0-5	Very fine sandy loam.	SM	A-4	0	100	100	80-90	40-50	---	NP
	5-60	Fine sandy loam, loam, very fine sandy loam.	SM, SM-SC, ML, CL-ML	A-4	0	100	100	80-90	40-65	20-25	NP-10
71*:											
Pando family----	0-10	Cobbly loam------	CL-ML	A-4	20-40	75-90	70-90	60-80	50-65	20-30	5-10
	10-55	Very cobbly loam, very cobbly clay loam.	GM-GC, SM-SC, GC, SC	A-2, A-4, A-6	30-55	55-75	50-70	40-60	30-50	25-40	5-15
	55	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rogert----------	0-9	Very gravelly loam.	GM-GC	A-2, A-4	5-15	50-65	40-55	35-50	25-40	20-30	5-10
	9-18	Very gravelly loam.	GM-GC	A-2, A-4	10-20	50-60	35-50	30-45	20-40	20-30	5-10
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
72--------------- Pastern	0-4	Cobbly fine sandy loam.	SM, SM-SC	A-2	15-25	70-80	65-75	50-65	25-35	20-30	NP-10
	4-15	Fine sandy loam, gravelly fine sandy loam, gravelly loam.	SM, SM-SC	A-2, A-4	0-10	75-100	70-100	50-85	20-50	20-30	NP-10
	15	Indurated--------	---	---	---	---	---	---	---	---	---
73--------------- Pennell	0-4	Fine sandy loam	SM, ML	A-4	0	100	100	70-85	40-55	20-30	NP-5
	4-15	Gravelly sandy loam, channery sandy loam, channery loam.	SM-SC, GM-GC, SM-GM	A-2, A-4	0-5	65-80	60-75	40-70	25-50	20-30	NP-10
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
74*:											
Pennell	0-3	Fine sandy loam	SM, ML	A-4	0	100	100	70-85	40-55	20-30	NP-5
	3-8	Fine sandy loam, sandy loam, loam.	SM-SC, CL-ML, SM-ML	A-2, A-4	0	100	90-100	60-90	30-70	20-30	NP-10
	8-15	Gravelly sandy loam, channery sandy loam, channery loam.	SM-SC, GM-GC, SM-GM	A-2, A-4	0-5	65-80	60-75	40-70	25-50	20-30	NP-10
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Moenkopie	0-6	Fine sandy loam	SM-SC	A-4	0	95-100	85-100	70-85	40-50	20-25	5-10
	6-9	Sandy loam, fine sandy loam.	SM-SC, SM	A-2, A-4	0-5	80-100	75-100	45-70	25-40	15-25	NP-10
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
75*:											
Pennell	0-4	Fine sandy loam	SM, ML	A-4	0	100	100	70-85	40-55	20-30	NP-5
	4-8	Fine sandy loam, sandy loam, loam.	SM-SC, CL-ML, SM-ML	A-2, A-4	0	100	90-100	60-90	30-70	20-30	NP-10
	8-14	Gravelly sandy loam, channery sandy loam, channery loam.	SM-SC, GM-GC, SM-GM	A-2, A-4	0-5	65-80	60-75	40-70	25-50	20-30	NP-10
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Moenkopie	0-2	Fine sandy loam	SM-SC	A-4	0	95-100	85-100	70-85	40-50	20-25	5-10
	2-9	Sandy loam, fine sandy loam.	SM-SC, SM	A-2, A-4	0-5	80-100	75-100	45-70	25-40	15-25	NP-10
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
76*:											
Redcreek	0-5	Fine sandy loam	SM-SC, SM	A-4	0	85-100	85-100	70-85	35-50	15-25	NP-10
	5-14	Fine sandy loam	SM-SC, SM	A-4	0	75-100	75-100	70-85	35-50	15-25	NP-10
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Windwhistle Variant	0-7	Very fine sandy loam.	SM	A-4	0	100	90-100	90-100	40-50	15-25	NP-5
	7-14	Fine sandy loam	SM	A-4	0	100	90-100	90-100	40-50	15-25	NP-5
	14-26	Fine sandy loam	SM	A-4	0	90-100	90-100	90-100	40-50	15-25	NP-5
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
77*. Riverwash											
78*: Riverwash.											

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
78*:											
Glenberg family-	0-3	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0	100	100	70-90	40-60	20-25	NP-10
	3-23	Loam, fine sandy loam.	CL-ML, SM-SC	A-4	0	100	100	70-90	40-75	20-30	5-10
	23-60	Fine sandy loam, very fine sandy loam, loam.	CL-ML, ML, SM, SM-SC	A-4	0	100	100	70-90	40-75	20-25	NP-10
Green River family----------	0-6	Loamy fine sand	SM, ML	A-4	0	100	100	85-95	35-55	---	NP
	6-20	Fine sandy loam, loam.	SM-SC, CL-ML	A-4	0	100	100	70-90	40-65	20-25	5-10
	20-40	Gravelly sandy loam, loam.	SM-SC, GM-GC	A-2, A-4	0-5	65-85	55-80	35-60	15-45	20-25	5-10
	40-60	Loam, fine sandy loam.	CL-ML, SM-SC	A-4	0	100	100	85-95	40-75	20-25	5-10
79*: Riverwash.											
Neskahi family--	0-4	Fine sandy loam	SM	A-4	0	100	100	70-85	40-50	20-25	NP-5
	4-60	Stratified fine sandy loam to silt loam.	ML, CL-ML	A-4	0	100	100	70-95	50-80	20-30	NP-10
80--------------- Rizno	0-10	Fine sandy loam	SM, SM-SC	A-4, A-2	0-10	95-100	90-100	65-85	30-50	20-30	NP-10
	10-18	Gravelly fine sandy loam, channery fine sandy loam, channery loam.	SM, SM-SC	A-2, A-4	0-15	65-80	60-75	40-55	25-40	20-30	NP-10
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
81*:											
Rizno-----------	0-10	Fine sandy loam	SM, SM-SC	A-4, A-2	0-10	95-100	90-100	65-85	30-50	20-30	NP-10
	10-18	Gravelly fine sandy loam, channery fine sandy loam, channery loam.	SM, SM-SC	A-2, A-4	0-15	65-80	60-75	40-55	25-40	20-30	NP-10
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Mido------------	0-15	Loamy fine sand	SM	A-2, A-4	0	100	100	75-95	30-50	---	NP
	15-60	Loamy fine sand, fine sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-35	---	NP
82*:											
Rizno-----------	0-3	Channery fine sandy loam.	SM, SM-SC	A-4, A-2	0-15	65-80	60-75	40-55	25-40	20-30	NP-10
	3-11	Gravelly fine sandy loam, channery fine sandy loam, channery loam.	SM, SM-SC	A-2, A-4	0-15	65-80	60-75	40-55	25-40	20-30	NP-10
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

See footnote at end of table

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
83*:											
Rizno-----------	0-3	Fine sandy loam	SM, SM-SC	A-4, A-2	0-10	95-100	90-100	65-85	30-50	20-30	NP-10
	3-17	Fine sandy loam, sandy loam.	SM, SM-SC	A-4, A-2	0-10	95-100	90-100	65-85	30-50	20-30	NP-10
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
84*:											
Robroost--------	0-5	Fine sandy loam	SM-SC	A-4	0	100	100	70-85	40-50	20-30	5-10
	5-10	Loam, fine sandy loam.	SM-SC, CL-ML	A-4	0	100	100	65-85	40-65	20-30	5-10
	10-60	Loam, fine sandy loam, sandy loam.	SM-SC, CL-ML	A-4	0	100	100	65-85	40-65	20-30	5-10
Goblin----------	0-3	Loam-------------	CL-ML	A-4	0	95-100	90-100	80-95	55-75	20-30	5-10
	3-12	Loam, fine sandy loam, loamy very fine sand.	SM-SC, CL-ML, SM, ML	A-4	0	85-100	80-100	70-85	35-70	20-30	NP-10
	12	Weathered bedrock	---	---	---	---	---	---	---	---	---
85*:											
Robroost--------	0-4	Fine sandy loam	SM-SC	A-4	0	100	100	70-85	40-50	20-30	5-10
	4-40	Loam, fine sandy loam.	SM-SC, CL-ML	A-4	0	100	100	65-85	40-65	20-30	5-10
	40-60	Loam, fine sandy loam, sandy loam.	SM-SC, CL-ML	A-4	0	100	100	65-85	40-65	20-30	5-10
Goblin----------	0-3	Loam-------------	CL-ML	A-4	0	95-100	90-100	80-95	55-75	20-30	5-10
	3-12	Loam, fine sandy loam, loamy very fine sand.	SM-SC, CL-ML, SM, ML	A-4	0	85-100	80-100	70-85	35-70	20-30	NP-10
	12	Weathered bedrock	---	---	---	---	---	---	---	---	---
86*. Rock outcrop											
87*:											
Rock outcrop.											
Arches----------	0-4	Loamy fine sand	SM	A-4	0	100	100	85-95	35-45	---	NP
	4-14	Loamy fine sand	SM	A-4	0	100	100	85-95	35-45	---	NP
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
88*:											
Rock outcrop.											
Chipeta---------	0-1	Silty clay-------	CL, ML	A-6, A-7	0	100	100	95-100	90-95	35-45	10-20
	1-19	Silty clay loam, silty clay, clay.	CL	A-6, A-7	0	100	100	95-100	90-95	35-45	15-20
	19	Weathered bedrock	---	---	---	---	---	---	---	---	---
89*:											
Rock outcrop.											
Chipeta---------	0-2	Silty clay-------	CL, ML	A-6, A-7	0	100	100	95-100	90-95	35-45	10-20
	2-12	Silty clay loam, silty clay, clay.	CL	A-6, A-7	0	100	100	95-100	90-95	35-45	15-20
	12	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
89*:											
Canyon family---	0-5	Extremely bouldery clay loam.	GC, GM	A-2	40-65	30-60	25-50	20-40	15-35	35-40	10-15
	5-18	Clay loam--------	CL, ML	A-6	0	80-100	75-100	70-95	60-80	35-40	10-15
	18	Weathered bedrock	---	---	---	---	---	---	---	---	---
90*:											
Rock outcrop.											
Farb------------	0-6	Channery sandy loam.	SM, SM-SC	A-2, A-1	0-5	65-85	60-75	35-50	20-35	15-25	NP-10
	6	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
91*:											
Rock outcrop.											
Montosa family--	0-3	Cobbly very fine sandy loam.	SM, SM-SC	A-2, A-4	20-30	80-90	75-85	60-75	30-50	20-30	NP-10
	3-11	Very cobbly loam	SM-SC, GM-GC	A-2, A-4	35-40	50-70	45-65	40-55	30-40	25-35	5-10
	11-52	Very cobbly coarse sandy loam, extremely cobbly coarse sandy loam.	GP-GM, GM, GM-GC	A-1, A-2	50-60	40-55	30-50	15-35	10-20	20-30	NP-10
	52-60	Extremely cobbly loamy coarse sand.	SP-SM, SP, GP, GP-GM	A-1	50-60	30-55	25-50	15-25	0-10	---	NP
92*:											
Rock outcrop.											
Stormitt--------	0-2	Cobbly loam------	CL-ML, SM-SC	A-4	15-25	80-90	75-85	60-75	45-60	25-30	5-10
	2-11	Very cobbly clay loam.	GC, CL, SC	A-2, A-6	45-60	60-80	50-70	45-65	30-55	25-40	10-20
	11-60	Very cobbly loam	GM-GC, SM-SC	A-2, A-4	45-60	60-80	50-75	40-65	30-50	25-30	5-10
Rizno-----------	0-3	Fine sandy loam	SM, SM-SC	A-4, A-2	0-10	95-100	90-100	65-85	30-50	20-30	NP-10
	3-12	Gravelly fine sandy loam, channery fine sandy loam, channery loam.	SM, SM-SC	A-2, A-4	0-15	65-80	60-75	40-55	25-40	20-30	NP-10
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
93*:											
Rock outcrop.											
Travessilla-----	0-8	Channery sandy loam.	SM	A-2, A-4	5-15	85-100	60-80	45-60	25-40	15-25	NP-5
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
94*:											
Rock outcrop.											
Travessilla-----	0-9	Channery sandy loam.	SM	A-2, A-4	5-15	85-100	60-80	45-60	25-40	15-25	NP-5
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
95*:											
Rogert----------	0-9	Very gravelly loam.	GM-GC	A-2, A-4	5-15	50-65	40-55	35-50	25-40	20-30	5-10
	9-18	Very gravelly loam.	GM-GC	A-2, A-4	10-20	50-60	35-50	30-45	20-40	20-30	5-10
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rogert Variant--	0-8	Loam-------------	CL-ML	A-4	0-5	85-95	80-90	70-80	50-70	20-30	5-10
	8-19	Very shaly loam	GM-GC	A-2	0-5	35-45	30-40	25-35	20-30	20-30	5-10
	19	Weathered bedrock.	---	---	---	---	---	---	---	---	---
96*. Rubble land											
97*:											
Shedado loamy fine sand------	0-10	Loamy fine sand	SM, ML	A-4	0	100	100	90-95	40-60	---	NP
	10-36	Loamy very fine sand, fine sandy loam.	ML	A-4	0	100	100	80-95	50-60	15-25	NP-5
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Shedado fine sandy loam-----	0-3	Fine sandy loam	SM	A-4	0	100	100	75-85	40-50	20-25	NP-5
	3-22	Loamy very fine sand, fine sandy loam.	ML	A-4	0	100	100	80-95	50-60	15-25	NP-5
	22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
98--------------- Sheppard	0-60	Sand-------------	SM	A-2	0	100	100	55-65	10-20	---	NP
99--------------- Sheppard	0-3	Loamy fine sand	SM	A-2	0	100	100	65-80	25-35	---	NP
	3-60	Loamy fine sand, fine sand, loamy sand.	SM	A-2	0	100	90-100	70-80	15-25	---	NP
100*:											
Sheppard--------	0-3	Loamy fine sand	SM	A-2	0	100	100	65-80	25-35	---	NP
	3-60	Loamy fine sand, fine sand, loamy sand.	SM	A-2	0	100	90-100	70-80	15-25	---	NP
Goblin----------	0-5	Loam-------------	CL-ML	A-4	0	95-100	90-100	80-95	55-75	20-30	5-10
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---
101*:											
Sheppard--------	0-3	Loamy fine sand	SM	A-2	0	100	100	65-80	25-35	---	NP
	3-60	Loamy fine sand, fine sand, loamy sand.	SM	A-2	0	100	90-100	70-80	15-25	---	NP
Leebench--------	0-2	Fine sandy loam	SM, SM-SC	A-4, A-2	0	100	85-100	60-75	30-50	20-30	NP-10
	2-11	Clay loam, loam, gravelly clay loam.	CL	A-6	0	80-100	75-100	70-95	60-80	30-40	10-15
	11-60	Stratified sandy loam to silt loam.	SM, ML	A-4	0	100	100	65-75	40-60	20-25	NP-5

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
102*:											
Sheppard--------	0-2	Loamy fine sand	SM	A-2	0	100	100	65-80	25-35	---	NP
	2-60	Loamy fine sand, fine sand, loamy sand.	SM	A-2	0	100	90-100	70-80	15-25	---	NP
Moenkopie--------	0-2	Channery sandy loam.	SM	A-1	0	55-80	50-75	25-40	10-25	---	NP
	2-10	Sandy loam, fine sandy loam.	SM-SC, SM	A-2, A-4	0-5	80-100	75-100	45-70	25-40	15-25	NP-10
	10	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
103*:											
Sheppard--------	0-60	Sand-------------	SM	A-2	0	100	100	55-65	10-20	---	NP
Moenkopie--------	0-6	Fine sandy loam	SM-SC	A-4	0	95-100	85-100	70-85	40-50	20-25	5-10
	6-9	Sandy loam, fine sandy loam.	SM-SC, SM	A-2, A-4	0-5	80-100	75-100	45-70	25-40	15-25	NP-10
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
104*:											
Sheppard--------	0-3	Loamy fine sand	SM	A-2	0	100	100	65-80	25-35	---	NP
	3-60	Loamy fine sand, fine sand, loamy sand.	SM	A-2	0	100	90-100	70-80	15-25	---	NP
Pennell---------	0-3	Fine sandy loam	SM, ML	A-4	0	100	100	70-85	40-55	20-30	NP-5
	3-16	Fine sandy loam, sandy loam, loam.	SM-SC, CL-ML, SM-ML	A-2, A-4	0	100	90-100	60-90	30-70	20-30	NP-10
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
105*:											
Sheppard--------	0-4	Loamy fine sand	SM	A-2	0	100	100	65-80	25-35	---	NP
	4-60	Loamy fine sand, fine sand, loamy sand.	SM	A-2	0	100	90-100	70-80	15-25	---	NP
Rock outcrop.											
106-------------- Stormitt	0-3	Gravelly loam----	SM-SC, GM-GC	A-2, A-4	0-5	65-80	60-75	40-65	30-50	25-30	5-10
	3-12	Very cobbly clay loam.	GC, CL, SC	A-2, A-6	45-60	60-80	50-70	45-65	30-55	25-40	10-20
	12-60	Very cobbly loam	GM-GC, SM-SC	A-2, A-4	45-60	60-80	50-75	40-65	30-50	25-30	5-10
107-------------- Stormitt	0-3	Extremely bouldery loam.	GM-GC	A-2, A-4	50-70	40-60	30-50	25-45	20-40	25-30	5-10
	3-12	Very cobbly clay loam.	GC, CL, SC	A-2, A-6	45-60	60-80	50-70	45-65	30-55	25-40	10-20
	12-60	Very cobbly loam	GM-GC, SM-SC	A-2, A-4	45-60	60-80	50-75	40-65	30-50	25-30	5-10

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
108*:											
Stormitt--------	0-7	Gravelly loam----	SM-SC, GM-GC	A-2, A-4	0-5	65-80	60-75	40-65	30-50	25-30	5-10
	7-16	Very cobbly clay loam.	GC, CL, SC	A-2, A-6	45-60	60-80	50-70	45-65	30-55	25-40	10-20
	16-60	Very cobbly loam	GM-GC, SM-SC	A-2, A-4	45-60	60-80	50-75	40-65	30-50	25-30	5-10
Rizno-----------	0-3	Fine sandy loam	SM, SM-SC	A-4, A-2	0-10	95-100	90-100	65-85	30-50	20-30	NP-10
	3-12	Gravelly fine sandy loam, channery fine sandy loam, channery loam.	SM, SM-SC	A-2, A-4	0-15	65-80	60-75	40-55	25-40	20-30	NP-10
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
109-------------- Strych	0-10	Gravelly fine sandy loam.	SM-SC	A-4	0-15	75-85	65-80	65-80	40-50	20-25	5-10
	10-60	Very stony loam, very stony sandy loam, very cobbly sandy loam.	SM-SC, GM-GC	A-4, A-2	20-40	60-85	50-80	40-65	20-45	25-30	5-10
110*:											
Tolman----------	0-9	Very cobbly fine sandy loam.	SM, SM-SC, GM, GM-GC	A-2, A-4	30-50	65-75	60-70	40-60	25-40	20-30	NP-10
	9-17	Very cobbly loam	GM-GC, GC	A-4	45-60	55-65	50-60	45-55	35-50	20-30	5-15
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
111-------------- Trachute	0-3	Loamy fine sand	SM	A-4, A-2	0	100	100	75-85	30-40	---	NP
	3-60	Fine sandy loam, sandy loam.	SM-SC, SM	A-4	0	100	100	75-85	35-50	20-30	NP-10
112*:											
Trachute--------	0-4	Loamy fine sand	SM	A-4, A-2	0	100	100	75-85	30-40	---	NP
	4-60	Fine sandy loam, sandy loam.	SM-SC, SM	A-4	0	100	100	75-85	35-50	20-30	NP-10
Goblin----------	0-7	Loam-------------	CL-ML	A-4	0	95-100	90-100	80-95	55-75	20-30	5-10
	7	Weathered bedrock	---	---	---	---	---	---	---	---	---
113*:											
Trachute--------	0-3	Loamy fine sand	SM	A-4, A-2	0	100	100	75-85	30-40	---	NP
	3-60	Fine sandy loam, sandy loam.	SM-SC, SM	A-4	0	100	100	75-85	35-50	20-30	NP-10
Sheppard--------	0-60	Sand-------------	SM	A-2	0	100	100	55-65	10-20	---	NP
114-------------- Trail	0-10	Loam-------------	CL-ML, ML	A-4	0	100	100	85-95	60-75	25-35	5-10
	10-60	Stratified sand to fine sandy loam.	SM	A-2, A-4	0	100	100	55-80	10-45	15-25	NP-5
115*:											
Travessilla-----	0-7	Channery sandy loam.	SM	A-2, A-4	5-15	85-100	60-80	45-60	25-40	15-25	NP-5
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Badland.											

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
115*: Rock outcrop.											
116*: Travessilla-----	0-6	Fine sandy loam	SM	A-2, A-4	0-5	90-100	90-100	60-80	30-50	15-25	NP-5
	6-12	Fine sandy loam, sandy loam, loam.	SM-SC, SM, CL-ML, ML	A-2, A-4	0-10	85-100	80-100	60-90	30-60	15-30	NP-10
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
117*: Wayneco---------	0-3	Fine sand--------	SM	A-2	0	85-100	80-100	60-85	15-25	---	NP
	3-9	Loamy fine sand	SM	A-2, A-4	0	85-100	80-100	70-90	30-40	---	NP
	9-19	Fine sandy loam, loam.	SM, ML	A-4	0	85-100	80-100	60-95	40-60	15-20	NP-5
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Mido------------	0-15	Loamy fine sand	SM	A-2, A-4	0	100	100	75-95	30-50	---	NP
	15-60	Loamy fine sand, fine sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-35	---	NP
118*: Wayneco---------	0-8	Fine sandy loam	SM	A-4	0	85-100	80-100	65-85	35-50	---	NP
	8-16	Fine sandy loam, loam.	SM, ML	A-4	0	85-100	80-100	60-95	40-60	15-20	NP-5
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Milok-----------	0-3	Loamy fine sand	ML, SM	A-4	0	100	100	85-95	40-55	---	NP
	3-60	Fine sandy loam	SM-SC	A-4	0	100	100	70-85	40-50	20-30	5-10
Rock outcrop.											
119*: Wayneco---------	0-4	Fine sandy loam	SM	A-4	0	85-100	80-100	65-85	35-50	---	NP
	4-16	Fine sandy loam, loam.	SM, ML	A-4	0	85-100	80-100	60-95	40-60	15-20	NP-5
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rizno-----------	0-1	Channery fine sandy loam.	SM, SM-SC	A-4, A-2	0-15	65-80	60-75	40-55	25-40	20-30	NP-10
	1-7	Gravelly fine sandy loam, channery fine sandy loam, channery loam.	SM, SM-SC	A-2, A-4	0-15	65-80	60-75	40-55	25-40	20-30	NP-10
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
120*: Windwhistle-----	0-2	Loamy very fine sand.	SM	A-4	0	100	100	90-100	35-50	---	NP
	2-28	Very fine sandy loam, fine sandy loam.	SM-SC, CL-ML	A-4	0	100	100	85-100	40-60	20-30	5-10
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 7.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
120*: Rock outcrop.											
121------------- Yarts	0-8	Fine sandy loam	SM-SC, CL-ML	A-4	0	100	100	70-85	40-60	20-30	5-10
	8-60	Fine sandy loam, sandy loam.	SM-SC, CL-ML	A-4	0	100	100	70-85	40-60	20-30	5-10
122------------- Yarts	0-3	Fine sandy loam	SM-SC, CL-ML	A-4	0	100	100	70-85	40-60	20-30	5-10
	3-60	Fine sandy loam, sandy loam.	SM-SC, CL-ML	A-4	0	100	100	70-85	40-60	20-30	5-10
123*:											
Yarts-----------	0-3	Loamy fine sand	SM	A-2, A-4	0	100	90-100	80-95	30-40	20-25	NP-5
	3-48	Fine sandy loam	SM-SC	A-4	0	100	90-100	70-85	40-50	20-25	5-10
	48	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Mido------------	0-15	Loamy fine sand	SM	A-2, A-4	0	100	100	75-95	30-50	---	NP
	15-60	Loamy fine sand, fine sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-35	---	NP
124*:											
Yarts-----------	0-3	Loamy fine sand	SM	A-2, A-4	0	100	90-100	80-95	30-40	20-25	NP-5
	3-54	Fine sandy loam	SM-SC	A-4	0	100	90-100	70-85	40-50	20-25	5-10
	54	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Mido------------	0-15	Loamy fine sand	SM	A-2, A-4	0	100	100	75-95	30-50	---	NP
	15-60	Loamy fine sand, fine sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-35	---	NP

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	G/cm	In/hr	In/in	pH	mmhos/cm					Pct
1*. Badland												
2*: Badland.												
Hanksville------	0-3	35-40	1.30-1.40	<0.06	0.14-0.20	7.9-9.0	>8	Moderate	0.24	2	8	<.5
	3-35	35-45	1.25-1.35	<0.06	0.14-0.20	7.9-9.0	>8	High------	0.43			
	35	---	---	---	---	---	---	----------	----			
3*: Badland.												
Rock outcrop.												
4--------------- Begay	0-5	2-10	1.40-1.50	2.0-6.0	0.08-0.11	7.9-8.4	<2	Low-------	0.49	5	2	1-3
	5-60	12-18	1.40-1.50	2.0-6.0	0.13-0.18	7.9-9.0	<2	Low-------	0.43			
5--------------- Begay	0-3	8-15	1.40-1.50	2.0-6.0	0.09-0.14	7.9-8.4	<2	Low-------	0.43	5	3	1-3
	3-30	12-18	1.40-1.50	2.0-6.0	0.13-0.18	7.9-9.0	<2	Low-------	0.43			
	30-60	5-12	1.40-1.50	2.0-6.0	0.10-0.15	7.9-9.0	<2	Low-------	0.37			
6*: Begay-----------	0-3	2-10	1.40-1.50	2.0-6.0	0.08-0.11	7.9-8.4	<2	Low-------	0.49	5	2	1-3
	3-45	12-18	1.40-1.50	2.0-6.0	0.13-0.18	7.9-9.0	<2	Low-------	0.43			
	45-60	5-12	1.40-1.50	2.0-6.0	0.10-0.15	7.9-9.0	<2	Low-------	0.37			
Mellenthin------	0-3	10-15	1.25-1.35	2.0-6.0	0.10-0.13	7.9-8.4	<2	Low-------	0.10	1	8	.8-2
	3-16	10-15	1.25-1.35	0.6-2.0	0.06-0.08	7.9-8.4	<2	Low-------	0.02			
	16	---	---	---	---	---	---	----------	----			
7*: Begay-----------	0-3	2-10	1.40-1.50	2.0-6.0	0.08-0.11	7.9-8.4	<2	Low-------	0.49	5	2	1-3
	3-45	12-18	1.40-1.50	2.0-6.0	0.13-0.18	7.9-9.0	<2	Low-------	0.43			
	45-60	5-12	1.40-1.50	2.0-6.0	0.10-0.15	7.9-9.0	<2	Low-------	0.37			
Mido------------	0-30	2-10	1.40-1.50	6.0-20	0.08-0.10	7.9-9.0	<2	Low-------	0.37	5	2	<1
	30-60	3-8	1.40-1.50	6.0-20	0.05-0.09	7.9-9.0	<2	Low-------	0.32			
8*: Begay-----------	0-3	2-10	1.40-1.50	2.0-6.0	0.08-0.11	7.9-8.4	<2	Low-------	0.49	5	2	1-3
	3-20	12-18	1.40-1.50	2.0-6.0	0.13-0.18	7.9-9.0	<2	Low-------	0.43			
	20-60	5-12	1.40-1.50	2.0-6.0	0.10-0.15	7.9-9.0	<2	Low-------	0.37			
Rizno-----------	0-3	3-18	1.30-1.55	2.0-6.0	0.08-0.12	7.4-8.4	<2	Low-------	0.32	1	3	.5-1
	3-17	5-18	1.30-1.55	2.0-6.0	0.08-0.12	7.9-9.0	<2	Low-------	0.32			
	17	---	---	---	---	---	---	----------	----			
9--------------- Billings	0-1	20-27	1.15-1.25	0.2-0.6	0.08-0.15	>8.4	>8	Moderate	0.49	5	4L	1-2
	1-60	27-35	1.15-1.25	0.06-0.2	0.08-0.15	>8.4	>8	Moderate	0.49			
10--------------- Billings	0-5	27-35	1.30-1.40	0.06-0.2	0.15-0.18	7.4-9.0	2-8	Moderate	0.43	5	4L	<.5
	5-60	27-35	1.30-1.40	0.06-0.2	0.15-0.18	7.4-9.0	2-8	Moderate	0.43			
11--------------- Billings	0-6	27-35	1.15-1.25	0.06-0.2	0.08-0.15	>8.4	>8	Moderate	0.43	5	4L	1-2
	6-40	27-35	1.15-1.25	0.06-0.2	0.08-0.15	>8.4	>8	Moderate	0.49			
	40-60	18-35	1.15-1.25	0.06-0.2	0.08-0.15	>8.4	>8	Moderate	0.49			

See footnote at end of table.

TABLE 8.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cm	In/hr	In/in	pH	mmhos/cm					Pct
12---------------- Billings Variant	0-8	40-45	1.15-1.25	0.06-0.2	0.17-0.19	7.9-8.4	<2	High-------	0.24	5	4	1-2
	8-60	40-50	1.15-1.25	0.06-0.2	0.17-0.19	7.9-9.0	<4	High-------	0.28			
13---------------- Blackston	0-5	10-20	1.25-1.40	0.6-2.0	0.11-0.13	7.9-8.4	<2	Low--------	0.28	1	3	.5-1
	5-27	23-35	1.20-1.35	0.6-2.0	0.10-0.14	7.9-9.0	<2	Low--------	0.15			
	27-60	5-10	1.35-1.45	6.0-20	0.02-0.05	7.9-9.0	<2	Low--------	0.05			
14, 15----------- Blackston	0-4	10-20	1.25-1.40	0.6-2.0	0.08-0.10	7.9-8.4	<2	Low--------	0.17	1	8	.5-1
	4-25	23-35	1.20-1.35	0.6-2.0	0.10-0.14	7.9-9.0	<2	Low--------	0.15			
	25-60	5-10	1.35-1.45	6.0-20	0.02-0.05	7.9-9.0	<2	Low--------	0.05			
16*:												
Blackston--------	0-4	10-20	1.25-1.40	0.6-2.0	0.08-0.10	7.9-8.4	<2	Low--------	0.17	1	8	.5-1
	4-25	23-35	1.20-1.35	0.6-2.0	0.10-0.14	7.9-9.0	<2	Low--------	0.15			
	25-60	5-10	1.35-1.45	6.0-20	0.02-0.05	7.9-9.0	<2	Low--------	0.05			
Leebench---------	0-3	12-20	1.30-1.40	0.6-2.0	0.10-0.12	>7.8	2-4	Low--------	0.24	1	3	<.5
	3-42	27-35	1.25-1.35	0.06-0.2	0.11-0.16	>8.4	4-16	Moderate	0.43			
	42-60	10-18	1.20-1.30	2.0-6.0	0.04-0.07	>8.4	4-16	Low--------	0.02			
17---------------- Bowdish	0-2	5-10	1.40-1.50	0.6-2.0	0.08-0.11	7.9-8.4	<2	Low--------	0.17	2	2	.5-1
	2-19	18-25	1.30-1.40	0.6-2.0	0.10-0.13	7.9-9.0	<2	Low--------	0.24			
	19-30	18-25	1.25-1.35	0.6-2.0	0.13-0.15	7.9-9.0	<2	Low--------	0.24			
	30	---	---	---	---	---	---	-----------	----			
18*:												
Bowdish----------	0-4	5-10	1.40-1.50	0.6-2.0	0.08-0.11	7.9-8.4	<2	Low--------	0.17	2	2	.5-1
	4-35	18-25	1.30-1.40	0.6-2.0	0.10-0.13	7.9-9.0	<2	Low--------	0.24			
	35-39	18-25	1.25-1.35	0.6-2.0	0.13-0.15	7.9-9.0	<2	Low--------	0.24			
	39	---	---	---	---	---	---	-----------	----			
Mido-------------	0-30	2-10	1.40-1.50	6.0-20	0.08-0.10	7.9-9.0	<2	Low--------	0.37	5	2	<1
	30-60	3-8	1.40-1.50	6.0-20	0.05-0.09	7.9-9.0	<2	Low--------	0.32			
19---------------- Bowdish Variant	0-3	18-20	1.35-1.45	0.6-2.0	0.10-0.14	7.9-8.4	<2	Low--------	0.20	3	3	<1
	3-20	20-25	1.25-1.35	0.6-2.0	0.13-0.19	7.9-8.4	<2	Moderate	0.32			
	20-44	20-30	1.25-1.35	0.6-2.0	0.13-0.19	7.9-8.4	<2	Moderate	0.28			
	44	---	---	---	---	---	---	-----------	----			
20*:												
Canyon family----	0-4	18-27	1.25-1.35	0.6-2.0	0.08-0.12	7.9-8.4	<2	Low--------	0.17	1	8	.5-2
	4-18	27-35	1.25-1.35	0.2-0.6	0.14-0.20	>7.8	<2	Moderate	0.32			
	18	---	---	---	---	---	---	-----------	----			
Rock outcrop.												
21*:												
Cerrillos--------	0-4	18-27	1.25-1.35	0.6-2.0	0.13-0.15	7.9-8.4	<2	Moderate	0.20	5	8	.5-1
	4-11	27-35	1.15-1.25	0.2-0.6	0.17-0.19	7.9-8.4	<2	Moderate	0.28			
	11-60	27-35	1.15-1.25	0.2-0.6	0.17-0.19	8.5-9.0	<2	Moderate	0.28			
Chipeta----------	0-1	40-47	1.15-1.25	0.06-0.2	0.11-0.16	7.4-8.4	8-16	Moderate	0.43	1	4L	<2
	1-19	35-45	1.15-1.25	0.06-0.2	0.11-0.16	7.4-9.0	8-16	Moderate	0.43			
	19	---	---	---	---	---	---	-----------	----			
22---------------- Cerrillos Variant	0-2	20-25	1.25-1.35	0.2-0.6	0.13-0.19	7.9-8.4	2-8	Low--------	0.32	3	4L	<1
	2-24	27-35	1.25-1.35	0.2-0.6	0.14-0.20	7.9-9.0	2-8	Moderate	0.37			
	24-36	20-27	1.25-1.35	0.2-0.6	0.13-0.19	7.9-8.4	2-8	Low--------	0.37			
	36	---	---	---	---	---	---	-----------	----			
23---------------- Chipeta	0-1	40-47	1.15-1.25	0.06-0.2	0.11-0.16	7.4-8.4	8-16	Moderate	0.43	1	4L	<2
	1-19	35-45	1.15-1.25	0.06-0.2	0.11-0.16	7.4-9.0	8-16	Moderate	0.43			
	19	---	---	---	---	---	---	-----------	----			

See footnote at end of table.

TABLE 8.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	G/cm	In/hr	In/in	pH	mmhos/cm					Pct
24-------------- Chipeta	0-3	40-47	1.15-1.25	0.06-0.2	0.11-0.18	7.4-9.0	8-16	Moderate	0.20	1	4L	<2
	3-15	35-45	1.15-1.25	0.06-0.2	0.11-0.16	7.4-9.0	8-16	Moderate	0.43			
	15	---	---	---	---	---	---	----------	----			
25*: Chipeta---------	0-3	40-47	1.15-1.25	0.06-0.2	0.11-0.18	7.4-9.0	8-16	Moderate	0.20	1	4L	<2
	3-12	35-45	1.15-1.25	0.06-0.2	0.11-0.16	7.4-9.0	8-16	Moderate	0.43			
	12	---	---	---	---	---	---	----------	----			
Badland.												
26*: Chipeta Variant	0-9	27-35	1.25-1.35	0.2-0.6	0.12-0.18	7.9-8.4	<2	Moderate	0.24	2	8	.5-2
	9-22	35-40	1.15-1.25	0.06-0.2	0.12-0.18	7.9-9.0	<2	Moderate	0.37			
	22	---	---	---	---	---	---	----------	----			
Badland.												
Rock outcrop.												
27*: Circleville-----	0-4	15-25	1.25-1.30	0.6-2.0	0.13-0.15	7.4-8.4	<2	Low--------	0.20	2	8	2-4
	4-12	23-32	1.25-1.30	0.6-2.0	0.10-0.13	7.4-8.4	<2	Moderate	0.15			
	12-36	15-20	1.25-1.40	0.6-2.0	0.09-0.11	7.9-9.0	<2	Low--------	0.15			
	36	---	---	---	---	---	---	----------	----			
Blazon----------	0-4	30-35	1.25-1.35	0.2-0.6	0.10-0.13	7.9-8.4	<2	Moderate	0.24	1	8	1-2
	4-11	30-35	1.25-1.35	0.2-0.6	0.16-0.18	7.9-8.4	<2	Moderate	0.37			
	11	---	---	---	---	---	---	----------	----			
28-------------- Delson	0-15	18-25	1.25-1.35	0.6-2.0	0.15-0.18	7.9-8.4	<2	Low--------	0.24	2	8	3-6
	15-40	40-50	1.15-1.25	0.06-0.2	0.14-0.16	7.9-8.4	<2	Moderate	0.17			
	40-60	40-50	1.15-1.25	0.06-0.2	0.08-0.10	7.9-8.4	<2	Moderate	0.10			
29*: Delson----------	0-15	18-25	1.25-1.35	0.6-2.0	0.13-0.15	7.9-8.4	<2	Low--------	0.24	2	8	3-6
	15-40	40-50	1.15-1.25	0.06-0.2	0.10-0.13	7.9-8.4	<2	Moderate	0.20			
	40-60	40-50	1.15-1.25	0.06-0.2	0.05-0.09	7.9-8.4	<2	Moderate	0.15			
Datino family---	0-10	18-27	1.25-1.35	0.6-2.0	0.13-0.18	6.6-8.4	<2	Low--------	0.32	2	6	2-5
	10-21	27-35	1.25-1.35	0.2-0.6	0.10-0.12	6.6-8.4	<2	Moderate	0.15			
	21	---	---	---	---	---	---	----------	----			
30*: Delson----------	0-16	18-25	1.25-1.35	0.6-2.0	0.15-0.18	7.9-8.4	<2	Low--------	0.24	2	8	3-6
	16-40	40-50	1.15-1.25	0.06-0.2	0.14-0.16	7.9-8.4	<2	Moderate	0.17			
	40-60	40-50	1.15-1.25	0.06-0.2	0.08-0.10	7.9-8.4	<2	Moderate	0.10			
Makoti family---	0-4	28-40	1.20-1.30	0.2-0.6	0.14-0.20	7.4-8.4	<2	Moderate	0.24	3	4	3-8
	4-41	28-35	1.10-1.20	0.06-0.2	0.14-0.20	7.9-8.4	<2	Moderate	0.37			
	41	---	---	---	---	---	---	----------	----			
31*: Duneland.												
Mido------------	0-2	2-10	1.40-1.50	6.0-20	0.08-0.10	7.9-9.0	<2	Low--------	0.37	5	2	<1
	2-60	3-8	1.40-1.50	6.0-20	0.05-0.09	7.9-9.0	<2	Low--------	0.32			
32-------------- Factory	0-2	5-15	1.30-1.45	2.0-6.0	0.10-0.12	7.4-8.4	<2	Low--------	0.28	3	3	.5-2
	2-8	7-18	1.30-1.45	2.0-6.0	0.08-0.14	7.4-9.0	<2	Low--------	0.24			
	8-29	7-18	1.30-1.45	2.0-6.0	0.08-0.14	7.9-9.0	<4	Low--------	0.20			
	29	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 8.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	G/cm	In/hr	In/in	pH	mmhos/cm					Pct
33	0-2	5-15	1.25-1.35	2.0-6.0	0.12-0.14	7.9-9.0	<2	Low	0.24	1	3	.5-1
Farb	2-17	5-15	1.25-1.35	2.0-6.0	0.12-0.14	7.9-9.0	<2	Low	0.24			
	17	---	---	---	---	---	---	---	---			
34*:												
Farb	0-1	5-15	1.25-1.35	2.0-6.0	0.12-0.14	7.9-9.0	<2	Low	0.24	1	3	.5-1
	1-19	5-15	1.25-1.35	2.0-6.0	0.12-0.14	7.9-9.0	<2	Low	0.24			
	19	---	---	---	---	---	---	---	---			
Rock outcrop.												
35*:												
Farb	0-3	5-15	1.25-1.35	2.0-6.0	0.12-0.14	7.9-9.0	<2	Low	0.24	1	3	.5-1
	3-14	5-15	1.25-1.35	2.0-6.0	0.12-0.14	7.9-9.0	<2	Low	0.24			
	14	---	---	---	---	---	---	---	---			
Farb, very shallow	0-6	5-15	1.25-1.35	2.0-6.0	0.10-0.12	7.9-9.0	<2	Low	0.17	1	8	.5-1
	6	---	---	---	---	---	---	---	---			
Rock outcrop.												
36*	0-3	10-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-8.4	<8	Low	0.24	5	3	.5-2
Glenberg family	3-23	12-18	1.25-1.35	0.6-2.0	0.13-0.17	7.9-9.0	<8	Low	0.28			
	23-60	10-18	1.35-1.45	2.0-6.0	0.11-0.17	7.9-9.0	<8	Low	0.28			
37*:												
Goblin	0-3	10-27	1.20-1.30	2.0-6.0	0.13-0.16	7.9-8.4	<2	Low	0.37	1	4L	.5-1
	3-12	5-20	1.20-1.30	2.0-6.0	0.07-0.15	7.9-8.4	<2	Low	0.32			
	12	---	---	---	---	---	---	---	---			
Chipeta	0-1	40-47	1.15-1.25	0.06-0.2	0.11-0.16	7.4-8.4	8-16	Moderate	0.43	1	4L	<2
	1-19	35-45	1.15-1.25	0.06-0.2	0.11-0.16	7.4-9.0	8-16	Moderate	0.43			
	19	---	---	---	---	---	---	---	---			
38*:												
Green River family	0-6	5-10	1.45-1.55	6.0-20	0.08-0.10	7.9-8.4	>4	Low	0.20	5	2	.5-3
	6-20	10-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-8.4	>4	Low	0.24			
	20-40	10-18	1.35-1.45	2.0-6.0	0.07-0.11	7.9-8.4	>4	Low	0.24			
	40-60	10-18	1.25-1.35	2.0-6.0	0.13-0.17	7.9-9.0	>4	Low	0.32			
Myton family extremely bouldery loam	0-6	18-27	1.25-1.35	0.6-2.0	0.07-0.11	7.9-8.4	<2	Low	0.15	5	8	.5-1
	6-60	10-18	1.35-1.45	2.0-6.0	0.05-0.08	7.9-9.0	<2	Low	0.05			
Myton family very gravelly sandy loam	0-6	10-15	1.35-1.45	2.0-6.0	0.05-0.08	7.9-8.4	<2	Low	0.10	5	8	.5-1
	6-60	10-18	1.35-1.45	2.0-6.0	0.05-0.08	7.9-9.0	<2	Low	0.05			
39*:												
Hanksville	0-7	35-40	1.35-1.45	<0.06	0.14-0.20	7.9-9.0	>8	Moderate	0.43	2	6	<.5
	7-39	35-45	1.25-1.35	<0.06	0.14-0.20	7.9-9.0	>8	High	0.43			
	39	---	---	---	---	---	---	---	---			
Chipeta	0-1	40-47	1.15-1.25	0.06-0.2	0.11-0.16	7.4-8.4	8-16	Moderate	0.43	1	4L	<2
	1-19	35-45	1.15-1.25	0.06-0.2	0.11-0.16	7.4-9.0	8-16	Moderate	0.43			
	19	---	---	---	---	---	---	---	---			
40	0-9	18-27	1.15-1.25	0.6-2.0	0.11-0.13	7.9-9.0	2-8	Low	0.43	5	4L	<2
Haverdad	9-21	18-27	1.25-1.35	0.6-2.0	0.11-0.13	7.9-8.4	2-8	Low	0.37			
	21-60	18-27	1.20-1.30	0.6-2.0	0.11-0.13	7.9-8.4	4-16	Low	0.43			

See footnote at end of table.

TABLE 8.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	G/cm	In/hr	In/in	pH	mmhos/cm					Pct
41--------------- Jocity	0-6	20-26	1.15-1.25	0.6-2.0	0.17-0.19	7.9-9.0	<2	Low--------	0.37	5	4L	<1
	6-44	18-35	1.25-1.40	0.2-0.6	0.15-0.17	7.9-9.0	<2	Moderate	0.37			
	44-60	10-15	1.25-1.40	2.0-6.0	0.10-0.12	7.9-9.0	<2	Low--------	0.32			
42--------------- Jocity	0-13	40-45	1.15-1.25	<0.06	0.17-0.19	7.4-7.8	<2	High-------	0.28	5	4	<1
	13-44	30-35	1.25-1.40	0.2-0.6	0.15-0.17	7.9-9.0	<2	Moderate	0.37			
	44-60	23-28	1.25-1.40	0.2-0.6	0.15-0.18	7.9-9.0	<2	Moderate	0.37			
43--------------- Leebench	0-3	27-35	1.25-1.35	0.2-0.6	0.12-0.18	>7.8	4-16	Moderate	0.15	1	8	<.5
	3-8	27-35	1.25-1.35	0.06-0.2	0.11-0.16	>8.4	4-16	Moderate	0.24			
	8-60	20-30	1.15-1.25	0.2-0.6	0.10-0.15	>8.4	4-16	Low--------	0.24			
44*:												
Leebench---------	0-3	10-18	1.20-1.30	0.6-2.0	0.11-0.13	>7.8	2-4	Low--------	0.37	1	3	<.5
	3-60	27-35	1.25-1.35	0.06-0.2	0.11-0.16	>8.4	4-16	Moderate	0.24			
Hanksville-------	0-2	35-40	1.35-1.45	<0.06	0.14-0.20	7.9-9.0	>8	Moderate	0.43	2	6	<.5
	2-39	35-45	1.25-1.35	<0.06	0.14-0.20	7.9-9.0	>8	High-------	0.43			
	39	---	---	---	---	---	---	-----------	----			
45*:												
Mellenthin-------	0-3	10-15	1.25-1.35	2.0-6.0	0.10-0.13	7.9-8.4	<2	Low--------	0.10	1	8	.8-2
	3-16	10-15	1.25-1.35	0.6-2.0	0.06-0.08	7.9-8.4	<2	Low--------	0.02			
	16	---	---	---	---	---	---	-----------	----			
Rock outcrop.												
Mido-------------	0-4	2-10	1.40-1.50	6.0-20	0.08-0.10	7.9-9.0	<2	Low--------	0.37	5	2	<1
	4-60	3-8	1.40-1.50	6.0-20	0.05-0.09	7.9-9.0	<2	Low--------	0.32			
46--------------- Mido	0-2	2-10	1.40-1.50	6.0-20	0.08-0.10	7.9-9.0	<2	Low--------	0.37	5	2	<1
	2-60	3-8	1.40-1.50	6.0-20	0.05-0.09	7.9-9.0	<2	Low--------	0.32			
47*:												
Mido-------------	0-30	2-10	1.40-1.50	6.0-20	0.08-0.10	7.9-9.0	<2	Low--------	0.37	5	2	<1
	30-60	3-8	1.40-1.50	6.0-20	0.05-0.09	7.9-9.0	<2	Low--------	0.32			
Wayneco----------	0-2	6-10	1.40-1.50	2.0-6.0	0.06-0.10	7.9-8.4	<2	Low--------	0.17	1	3	1-2
	2-16	10-18	1.35-1.40	0.6-2.0	0.08-0.13	7.9-9.0	<2	Low--------	0.28			
	16	---	---	---	---	---	---	-----------	----			
Milok------------	0-3	5-10	1.45-1.55	6.0-20	0.08-0.10	7.9-8.4	<2	Low--------	0.37	5	2	.5-1
	3-60	12-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-9.0	<4	Low--------	0.24			
48--------------- Milok	0-12	5-10	1.45-1.55	6.0-20	0.08-0.10	7.9-8.4	<2	Low--------	0.37	5	2	.5-1
	12-47	12-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-9.0	<4	Low--------	0.24			
	47-60	3-8	1.45-1.55	>20	0.05-0.07	7.9-9.0	<4	Low--------	0.05			
49--------------- Milok	0-5	12-18	1.35-1.45	2.0-6.0	0.10-0.13	7.4-8.4	<2	Low--------	0.24	5	3	1-2
	5-60	12-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-9.0	<4	Low--------	0.24			
50*:												
Milok------------	0-12	5-10	1.45-1.55	6.0-20	0.08-0.10	7.9-8.4	<2	Low--------	0.37	5	2	.5-1
	12-60	12-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-9.0	<4	Low--------	0.24			
Begay------------	0-8	2-10	1.40-1.50	2.0-6.0	0.08-0.11	7.9-8.4	<2	Low--------	0.49	5	2	1-3
	8-32	12-18	1.40-1.50	2.0-6.0	0.13-0.18	7.9-9.0	<2	Low--------	0.43			
	32-60	5-12	1.40-1.50	2.0-6.0	0.10-0.15	7.9-9.0	<2	Low--------	0.37			
51*:												
Milok------------	0-2	5-10	1.45-1.55	6.0-20	0.08-0.10	7.9-8.4	<2	Low--------	0.37	5	2	.5-1
	2-60	12-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-9.0	<4	Low--------	0.24			

See footnote at end of table.

TABLE 8.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	G/cm	In/hr	In/in	pH	mmhos/cm					Pct
51*:												
Chipeta----------	0-3	40-47	1.15-1.25	0.06-0.2	0.11-0.16	7.4-8.4	8-16	Moderate	0.43	1	4L	<2
	3-11	35-45	1.15-1.25	0.06-0.2	0.11-0.16	7.4-9.0	8-16	Moderate	0.43			
	11	---	---	---	---	---	---	----------	-----			
52*:												
Milok------------	0-3	5-10	1.45-1.55	6.0-20	0.08-0.10	7.9-8.4	<2	Low--------	0.37	5	2	.5-1
	3-60	12-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-9.0	<4	Low--------	0.24			
Mido-------------	0-30	2-10	1.40-1.50	6.0-20	0.08-0.10	7.9-9.0	<2	Low--------	0.37	5	2	<1
	30-60	3-8	1.40-1.50	6.0-20	0.05-0.09	7.9-9.0	<2	Low--------	0.32			
53*:												
Milok------------	0-4	5-10	1.45-1.55	6.0-20	0.08-0.10	7.9-8.4	<2	Low--------	0.37	5	2	.5-1
	4-60	12-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-9.0	<4	Low--------	0.24			
Pastern----------	0-5	7-15	1.30-1.45	2.0-6.0	0.12-0.14	7.9-9.0	<2	Low--------	0.32	1	3	<1
	5-12	5-18	1.25-1.45	0.6-2.0	0.08-0.14	7.9-9.0	2-4	Low--------	0.20			
	12	---	---	---	---	---	---	----------	-----			
54--------------- Mivida	0-6	5-10	1.45-1.55	6.0-20	0.08-0.1	7.9-8.4	<2	Low--------	0.37	5	2	.5-1
	6-60	10-18	1.35-1.45	2.0-6.0	0.10-0.13	7.9-9.0	<2	Low--------	0.24			
55*:												
Mivida-----------	0-6	5-10	1.45-1.55	6.0-20	0.08-0.1	7.9-8.4	<2	Low--------	0.37	5	2	.5-1
	6-60	10-18	1.35-1.45	2.0-6.0	0.10-0.13	7.9-9.0	<2	Low--------	0.24			
Goblin-----------	0-3	10-27	1.20-1.30	2.0-6.0	0.13-0.16	7.9-8.4	<2	Low--------	0.37	1	4L	.5-1
	3-12	5-20	1.20-1.30	2.0-6.0	0.07-0.15	7.9-8.4	<2	Low--------	0.32			
	12	---	---	---	---	---	---	----------	-----			
56--------------- Mivida Variant	0-8	10-18	1.35-1.45	0.6-2.0	0.06-0.07	8.5-9.0	<2	Low--------	0.20	5	8	<1
	8-15	10-18	1.35-1.45	0.6-2.0	0.08-0.15	8.5-9.0	<2	Low--------	0.43			
	15-48	10-18	1.35-1.45	0.6-2.0	0.10-0.15	>8.4	<2	Low--------	0.24			
	48	---	---	---	---	---	---	----------	-----			
57--------------- Moenkopie	0-3	12-18	1.35-1.45	0.6-2.0	0.10-0.14	7.4-9.0	<2	Low--------	0.20	1	8	<1
	3-19	7-20	1.35-1.45	2.0-6.0	0.10-0.13	7.4-9.0	<2	Low--------	0.28			
	19	---	---	---	---	---	---	----------	-----			
58*:												
Moenkopie--------	0-3	12-18	1.35-1.45	0.6-2.0	0.10-0.14	7.4-9.0	<2	Low--------	0.20	1	8	<1
	3-17	7-20	1.35-1.45	2.0-6.0	0.10-0.13	7.4-9.0	<2	Low--------	0.28			
	17	---	---	---	---	---	---	----------	-----			
Chipeta----------	0-2	40-47	1.15-1.25	0.06-0.2	0.11-0.16	7.4-8.4	8-16	Moderate	0.43	1	4L	<2
	2-14	35-45	1.15-1.25	0.06-0.2	0.11-0.16	7.4-9.0	8-16	Moderate	0.43			
	14	---	---	---	---	---	---	----------	-----			
59*:												
Moenkopie fine sandy loam------	0-3	12-18	1.35-1.45	0.6-2.0	0.10-0.14	7.4-9.0	<2	Low--------	0.20	1	8	<1
	3-14	7-20	1.35-1.45	2.0-6.0	0.10-0.13	7.4-9.0	<2	Low--------	0.28			
	14	---	---	---	---	---	---	----------	-----			
Moenkopie channery sandy loam-----------	0-2	2-12	1.40-1.50	6.0-20.0	0.05-0.09	7.4-9.0	<2	Low--------	0.15	1	8	<1
	2-9	7-20	1.35-1.45	2.0-6.0	0.10-0.13	7.4-9.0	<2	Low--------	0.28			
	9	---	---	---	---	---	---	----------	-----			
Rock outcrop.												

See footnote at end of table.

TABLE 8.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cm	In/hr	In/in	pH	mmhos/cm					Pct
60, 61----------- Moffat	0-2	2-6	1.45-1.55	2.0-6.0	0.08-0.10	7.4-8.4	<2	Low--------	0.20	5	2	<1
	2-60	7-18	1.30-1.45	2.0-6.0	0.11-0.14	7.9-9.0	<2	Low--------	0.24			
62*:												
Moffat----------	0-2	2-6	1.45-1.55	2.0-6.0	0.08-0.10	7.4-8.4	<2	Low--------	0.20	5	2	<1
	2-14	7-18	1.30-1.45	2.0-6.0	0.11-0.14	7.9-9.0	<2	Low--------	0.24			
	14-60	2-18	1.40-1.55	2.0-6.0	0.07-0.12	7.9-9.0	<2	Low--------	0.17			
Sheppard--------	0-3	2-5	1.50-1.60	6.0-20	0.06-0.08	7.4-8.4	<2	Low--------	0.24	5	2	<.5
	3-60	3-8	1.50-1.60	6.0-20	0.06-0.08	7.4-9.0	<2	Low--------	0.20			
63*-------------- Montosa family	0-3	10-20	1.40-1.50	0.6-2.0	0.09-0.11	7.4-8.4	<2	Low--------	0.20	1	8	1-3
	3-11	15-25	1.25-1.40	0.6-2.0	0.08-0.11	7.4-8.4	<2	Low--------	0.15			
	11-52	10-20	1.40-1.50	2.0-6.0	0.05-0.08	7.9-9.0	<2	Low--------	0.10			
	52-60	2-10	1.45-1.55	6.0-20	0.03-0.04	7.9-9.0	<2	Low--------	0.05			
64--------------- Monue	0-3	3-5	1.45-1.55	2.0-6.0	0.07-0.10	7.9-8.4	<2	Low--------	0.20	5	2	<1
	3-60	8-17	1.35-1.45	2.0-6.0	0.10-0.15	7.9-9.0	<2	Low--------	0.28			
65*:												
Monue Variant---	0-8	5-12	1.35-1.45	0.6-2.0	0.07-0.10	7.9-8.4	<2	Low--------	0.24	3	3	<1
	8-24	15-18	1.35-1.45	0.6-2.0	0.07-0.10	7.9-8.4	<2	Low--------	0.24			
	24-39	15-18	1.25-1.35	0.6-2.0	0.09-0.15	7.9-8.4	<2	Low--------	0.28			
	39	---	---	---	---	---	---	-----------	-----			
Farb------------	0-3	5-15	1.25-1.35	2.0-6.0	0.12-0.14	7.9-9.0	<2	Low--------	0.24	1	3	.5-1
	3-12	5-15	1.25-1.35	2.0-6.0	0.12-0.14	7.9-9.0	<2	Low--------	0.24			
	12	---	---	---	---	---	---	-----------	-----			
Rock outcrop.												
66*:												
Myton family----	0-6	18-27	1.25-1.35	0.6-2.0	0.07-0.11	7.9-8.4	<2	Low--------	0.15	5	8	.5-1
	6-60	10-18	1.35-1.45	2.0-6.0	0.05-0.08	7.9-9.0	<2	Low--------	0.05			
Travessilla-----	0-3	3-13	1.45-1.60	2.0-6.0	0.09-0.13	7.4-8.4	<2	Low--------	0.28	2	3	.5-1
	3-12	8-18	1.30-1.45	0.6-6.0	0.12-0.16	7.4-9.0	<2	Low--------	0.32			
	12	---	---	---	---	---	---	-----------	-----			
Rock outcrop.												
67*-------------- Olnes family	0-6	10-20	1.15-1.25	0.6-2.0	0.09-0.14	5.6-6.5	<2	Low--------	0.20	1	8	2-3
	6-36	10-20	1.25-1.30	0.6-2.0	0.11-0.14	5.6-6.5	<2	Low--------	0.15			
	36-59	10-20	1.25-1.30	0.6-2.0	0.06-0.09	5.6-6.5	<2	Low--------	0.10			
	59	---	---	---	---	---	---	-----------	-----			
68*:												
Olnes family----	0-6	10-20	1.15-1.25	0.6-2.0	0.09-0.14	5.6-6.5	<2	Low--------	0.20	1	8	2-3
	6-36	10-20	1.25-1.30	0.6-2.0	0.11-0.14	5.6-6.5	<2	Low--------	0.15			
	36-59	10-20	1.25-1.30	0.6-2.0	0.06-0.09	5.6-6.5	<2	Low--------	0.10			
	59	---	---	---	---	---	---	-----------	-----			
Pando family----	0-10	15-25	1.25-1.35	0.6-2.0	0.11-0.15	6.6-7.8	<2	Low--------	0.20	1	8	3-6
	10-55	18-35	1.20-1.30	0.6-2.0	0.08-0.11	6.6-8.4	<2	Low--------	0.10			
	55	---	---	---	---	---	---	-----------	-----			
69*:												
Otero family----	0-5	10-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-8.4	<2	Low--------	0.20	5	3	.5-1
	5-60	10-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-8.4	<2	Low--------	0.24			
Glenberg family-	0-3	10-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-8.4	<8	Low--------	0.24	5	3	.5-2
	3-23	12-18	1.25-1.35	0.6-2.0	0.13-0.17	7.9-9.0	<8	Low--------	0.28			
	23-60	10-18	1.35-1.45	2.0-6.0	0.11-0.17	7.9-9.0	<8	Low--------	0.28			

See footnote at end of table.

TABLE 8.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cm	In/hr	In/in	pH	mmhos/cm					Pct
70---------------- Palma	0-5	8-12	1.20-1.45	2.0-6.0	0.12-0.14	7.4-8.4	<2	Low--------	0.32	5	3	.5-1
	5-60	12-18	1.20-1.45	2.0-6.0	0.12-0.14	>7.3	<2	Low--------	0.28			
71*:												
Pando family----	0-10	15-25	1.25-1.35	0.6-2.0	0.11-0.15	6.6-7.8	<2	Low--------	0.20	1	8	3-6
	10-55	18-35	1.20-1.30	0.6-2.0	0.08-0.11	6.6-8.4	<2	Low--------	0.10			
	55	---	---	---	---	---	---	-----------	----			
Rogert----------	0-9	12-18	1.20-1.35	2.0-6.0	0.06-0.11	6.6-7.3	<2	Low--------	0.10	1	8	3-6
	9-18	12-18	1.20-1.35	2.0-6.0	0.05-0.09	6.6-7.3	<2	Low--------	0.10			
	18	---	---	---	---	---	---	-----------	----			
72---------------- Pastern	0-4	5-18	1.25-1.45	2.0-6.0	0.08-0.11	7.9-9.0	<2	Low--------	0.20	1	8	<1
	4-15	5-18	1.25-1.45	0.6-2.0	0.08-0.14	7.9-9.0	2-4	Low--------	0.20			
	15	---	---	---	---	---	---	-----------	----			
73---------------- Pennell	0-4	10-15	1.35-1.45	2.0-6.0	0.10-0.20	7.9-8.4	<2	Low--------	0.37	1	3	<.5
	4-15	10-25	1.35-1.45	0.6-2.0	0.10-0.20	7.9-9.0	<2	Low--------	0.10			
	15	---	---	---	---	---	---	-----------	----			
74*:												
Pennell---------	0-3	10-15	1.35-1.45	2.0-6.0	0.10-0.20	7.9-8.4	<2	Low--------	0.37	1	3	<.5
	3-8	10-25	1.35-1.45	0.6-2.0	0.10-0.20	7.9-9.0	<2	Low--------	0.32			
	8-15	10-25	1.35-1.45	0.6-2.0	0.10-0.20	7.9-9.0	<2	Low--------	0.10			
	15	---	---	---	---	---	---	-----------	----			
Moenkopie-------	0-6	12-18	1.35-1.45	0.6-2.0	0.10-0.14	7.4-9.0	<2	Low--------	0.20	1	8	<1
	6-9	7-20	1.35-1.45	2.0-6.0	0.10-0.13	7.4-9.0	<2	Low--------	0.28			
	9	---	---	---	---	---	---	-----------	----			
Rock outcrop.												
75*:												
Pennell---------	0-4	10-15	1.35-1.45	2.0-6.0	0.10-0.20	7.9-8.4	<2	Low--------	0.37	1	3	<.5
	4-8	10-25	1.35-1.45	0.6-2.0	0.10-0.20	7.9-9.0	<2	Low--------	0.32			
	8-14	10-25	1.35-1.45	0.6-2.0	0.10-0.20	7.9-9.0	<2	Low--------	0.10			
	14	---	---	---	---	---	---	-----------	----			
Moenkopie-------	0-2	12-18	1.35-1.45	0.6-2.0	0.10-0.14	7.4-9.0	<2	Low--------	0.20	1	8	<1
	2-9	7-20	1.35-1.45	2.0-6.0	0.10-0.13	7.4-9.0	<2	Low--------	0.28			
	9	---	---	---	---	---	---	-----------	----			
Rock outcrop.												
76*:												
Redcreek--------	0-5	10-18	1.35-1.45	2.0-6.0	0.12-0.16	7.9-8.4	<2	Low--------	0.28	1	3	1-3
	5-14	10-18	1.35-1.45	2.0-6.0	0.12-0.16	7.9-9.0	<2	Low--------	0.28			
	14	---	---	---	---	---	---	-----------	----			
Windwhistle Variant--------	0-7	6-15	1.35-1.45	0.6-2.0	0.11-0.13	7.4-8.4	<2	Low--------	0.20	3	3	2-3
	7-14	12-15	1.35-1.45	0.6-2.0	0.11-0.13	7.9-8.4	<2	Low--------	0.24			
	14-26	12-15	1.35-1.45	0.6-2.0	0.11-0.13	7.9-8.4	<2	Low--------	0.24			
	26	---	---	---	---	---	---	-----------	----			
77*. Riverwash												
78*:												
Riverwash.												
Glenberg family-	0-3	10-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-8.4	<8	Low--------	0.24	5	3	.5-2
	3-23	12-18	1.25-1.35	0.6-2.0	0.13-0.17	7.9-9.0	<8	Low--------	0.28			
	23-60	10-18	1.35-1.45	2.0-6.0	0.11-0.17	7.9-9.0	<8	Low--------	0.28			

See footnote at end of table.

TABLE 8.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	G/cm	In/hr	In/in	pH	mmhos/cm					Pct
78*:												
Green River family---------	0-6	5-10	1.45-1.55	6.0-20	0.08-0.10	7.9-8.4	>4	Low-------	0.20	5	2	.5-3
	6-20	10-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-8.4	>4	Low-------	0.24			
	20-40	10-18	1.35-1.45	2.0-6.0	0.07-0.11	7.9-8.4	>4	Low-------	0.24			
	40-60	10-18	1.25-1.35	2.0-6.0	0.13-0.17	7.9-9.0	>4	Low-------	0.32			
79*:												
Riverwash.												
Neskahi family--	0-4	10-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-8.4	<2	Low-------	0.20	5	3	.5-2
	4-60	10-18	1.35-1.45	0.6-2.0	0.10-0.20	>8.4	<2	Low-------	0.37			
80--------------- Rizno	0-10	3-18	1.30-1.55	2.0-6.0	0.08-0.12	7.4-8.4	<2	Low-------	0.32	1	3	.5-1
	10-18	5-18	1.30-1.55	2.0-6.0	0.08-0.12	7.9-9.0	<2	Low-------	0.20			
	18	---	---	---	---	---	---	----------	----			
81*:												
Rizno-----------	0-10	3-18	1.30-1.55	2.0-6.0	0.08-0.12	7.4-8.4	<2	Low-------	0.32	1	3	.5-1
	10-18	5-18	1.30-1.55	2.0-6.0	0.08-0.12	7.9-9.0	<2	Low-------	0.20			
	18	---	---	---	---	---	---	----------	----			
Mido------------	0-15	2-10	1.40-1.50	6.0-20	0.08-0.10	7.9-9.0	<2	Low-------	0.37	5	2	<1
	15-60	3-8	1.40-1.50	6.0-20	0.05-0.09	7.9-9.0	<2	Low-------	0.32			
82*:												
Rizno-----------	0-3	5-18	1.30-1.55	2.0-6.0	0.08-0.12	7.4-8.4	<2	Low-------	0.20	1	8	.5-1
	3-11	5-18	1.30-1.55	2.0-6.0	0.08-0.12	7.9-9.0	<2	Low-------	0.20			
	11	---	---	---	---	---	---	----------	----			
Rock outcrop.												
83*:												
Rizno-----------	0-3	3-18	1.30-1.55	2.0-6.0	0.08-0.12	7.4-8.4	<2	Low-------	0.32	1	3	.5-1
	3-17	5-18	1.30-1.55	2.0-6.0	0.08-0.12	7.9-9.0	<2	Low-------	0.32			
	17	---	---	---	---	---	---	----------	----			
Rock outcrop.												
84*:												
Robroost--------	0-5	10-18	1.35-1.45	0.6-2.0	0.10-0.14	7.9-9.0	<2	Low-------	0.24	5	3	<.5
	5-10	10-18	1.35-1.45	0.6-2.0	0.12-0.15	7.9-9.0	2-4	Low-------	0.28			
	10-60	10-18	1.35-1.45	0.6-2.0	0.11-0.15	7.9-9.0	<2	Low-------	0.28			
Goblin----------	0-3	10-27	1.20-1.30	2.0-6.0	0.13-0.16	7.9-8.4	<2	Low-------	0.37	1	4L	.5-1
	3-12	5-20	1.20-1.30	2.0-6.0	0.07-0.15	7.9-8.4	<2	Low-------	0.32			
	12	---	---	---	---	---	---	----------	----			
85*:												
Robroost--------	0-4	10-18	1.35-1.45	0.6-2.0	0.10-0.14	7.9-9.0	<2	Low-------	0.24	5	3	<.5
	4-40	10-18	1.35-1.45	0.6-2.0	0.12-0.15	7.9-9.0	2-4	Low-------	0.28			
	40-60	10-18	1.35-1.45	0.6-2.0	0.11-0.15	7.9-9.0	<2	Low-------	0.28			
Goblin----------	0-3	10-27	1.20-1.30	2.0-6.0	0.13-0.16	7.9-8.4	<2	Low-------	0.37	1	4L	.5-1
	3-12	5-20	1.20-1.30	2.0-6.0	0.07-0.15	7.9-8.4	<2	Low-------	0.32			
	12	---	---	---	---	---	---	----------	----			
86*.												
Rock outcrop												
87*:												
Rock outcrop.												

See footnote at end of table.

TABLE 8.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cm	In/hr	In/in	pH	mmhos/cm					Pct
87*:												
Arches----------	0-4	3-8	1.40-1.50	6.0-20	0.08-0.10	7.4-8.4	<2	Low-------	0.28	1	2	<1
	4-14	3-8	1.40-1.50	6.0-20	0.08-0.10	7.4-9.0	<2	Low-------	0.28			
	14	---	---	---	---	---	---	----------	----			
88*:												
Rock outcrop.												
Chipeta---------	0-1	40-47	1.15-1.25	0.06-0.2	0.11-0.16	7.4-8.4	8-16	Moderate	0.43	1	4L	<2
	1-19	35-45	1.15-1.25	0.06-0.2	0.11-0.16	7.4-9.0	8-16	Moderate	0.43			
	19	---	---	---	---	---	---	----------	----			
89*:												
Rock outcrop.												
Chipeta---------	0-2	40-47	1.15-1.25	0.06-0.2	0.11-0.16	7.4-8.4	8-16	Moderate	0.43	1	4L	<2
	2-12	35-45	1.15-1.25	0.06-0.2	0.11-0.16	7.4-9.0	8-16	Moderate	0.43			
	12	---	---	---	---	---	---	----------	----			
Canyon family---	0-5	27-35	1.25-1.35	0.2-0.6	0.10-0.14	7.9-8.4	<2	Moderate	0.10	1	8	.5-2
	5-18	27-35	1.25-1.35	0.2-0.6	0.14-0.20	>7.8	<2	Moderate	0.32			
	18	---	---	---	---	---	---	----------	----			
90*:												
Rock outcrop.												
Farb------------	0-6	5-15	1.25-1.35	2.0-6.0	0.10-0.12	7.9-9.0	<2	Low-------	0.17	1	8	.5-1
	6	---	---	---	---	---	---	----------	----			
91*:												
Rock outcrop.												
Montosa family--	0-3	10-20	1.40-1.50	0.6-2.0	0.09-0.11	7.4-8.4	<2	Low-------	0.20	1	8	1-3
	3-11	15-25	1.25-1.40	0.6-2.0	0.08-0.11	7.4-8.4	<2	Low-------	0.15			
	11-52	10-20	1.40-1.50	2.0-6.0	0.05-0.08	7.9-9.0	<2	Low-------	0.10			
	52-60	2-10	1.45-1.55	6.0-20	0.03-0.04	7.9-9.0	<2	Low-------	0.05			
92*:												
Rock outcrop.												
Stormitt--------	0-2	16-25	1.25-1.35	0.6-2.0	0.11-0.14	7.9-8.4	<2	Low-------	0.20	1	8	1-2
	2-11	27-35	1.25-1.35	0.6-2.0	0.09-0.12	7.9-8.4	<2	Moderate	0.10			
	11-60	18-27	1.25-1.35	0.6-2.0	0.08-0.10	7.9-8.4	<2	Low-------	0.10			
Rizno-----------	0-3	3-18	1.30-1.55	2.0-6.0	0.08-0.12	7.4-8.4	<2	Low-------	0.32	1	3	.5-1
	3-12	5-18	1.30-1.55	2.0-6.0	0.08-0.12	7.9-9.0	<2	Low-------	0.20			
	12	---	---	---	---	---	---	----------	----			
93*:												
Rock outcrop.												
Travessilla-----	0-8	6-13	1.45-1.60	2.0-6.0	0.10-0.14	7.4-8.4	<2	Low-------	0.15	2	8	.5-1
	8	---	---	---	---	---	---	----------	----			
94*:												
Rock outcrop.												
Travessilla-----	0-9	6-13	1.45-1.60	2.0-6.0	0.10-0.14	7.4-8.4	<2	Low-------	0.15	2	8	.5-1
	9	---	---	---	---	---	---	----------	----			
95*:												
Rogert----------	0-9	12-18	1.20-1.35	2.0-6.0	0.06-0.11	6.6-7.3	<2	Low-------	0.10	1	8	3-6
	9-18	12-18	1.20-1.35	2.0-6.0	0.05-0.09	6.6-7.3	<2	Low-------	0.10			
	18	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 8.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	G/cm	In/hr	In/in	pH	mmhos/cm					Pct
95*:												
Rogert Variant--	0-8	18-27	1.25-1.35	0.6-2.0	0.13-0.15	6.6-7.3	<2	Low-------	0.28	1	5	3-6
	8-19	18-27	1.25-1.35	0.6-2.0	0.08-0.10	7.4-7.8	<2	Low-------	0.15			
	19	---	---	---	---	---	---	----------	----			
96*.												
Rubble land												
97*:												
Shedado loamy fine sand------	0-10	5-10	1.45-1.55	2.0-6.0	0.09-0.11	6.6-8.4	<2	Low-------	0.49	2	2	2-3
	10-36	5-18	1.40-1.50	2.0-6.0	0.09-0.11	6.6-8.4	<2	Low-------	0.28			
	36	---	---	---	---	---	---	----------	----			
Shedado fine sandy loam-----	0-3	10-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-8.4	<2	Low-------	0.24	2	3	2-3
	3-22	5-18	1.40-1.50	2.0-6.0	0.09-0.11	6.6-8.4	<2	Low-------	0.28			
	22	---	---	---	---	---	---	----------	----			
98--------------- Sheppard	0-60	2-5	1.50-1.60	6.0-20	0.05-0.07	7.4-8.4	<2	Low-------	0.20	5	1	<.5
99--------------- Sheppard	0-3	2-5	1.50-1.60	6.0-20	0.06-0.08	7.4-8.4	<2	Low-------	0.24	5	2	<.5
	3-60	3-8	1.50-1.60	6.0-20	0.06-0.08	7.4-9.0	<2	Low-------	0.20			
100*:												
Sheppard--------	0-3	2-5	1.50-1.60	6.0-20	0.06-0.08	7.4-8.4	<2	Low-------	0.24	5	2	<.5
	3-60	3-8	1.50-1.60	6.0-20	0.06-0.08	7.4-9.0	<2	Low-------	0.20			
Goblin----------	0-5	10-27	1.20-1.30	2.0-6.0	0.13-0.16	7.9-8.4	<2	Low-------	0.37	1	4L	.5-1
	5	---	---	---	---	---	---	----------	----			
101*:												
Sheppard--------	0-3	2-5	1.50-1.60	6.0-20	0.06-0.08	7.4-8.4	<2	Low-------	0.24	5	2	<.5
	3-60	3-8	1.50-1.60	6.0-20	0.06-0.08	7.4-9.0	<2	Low-------	0.20			
Leebench--------	0-2	10-18	1.20-1.30	0.6-2.0	0.11-0.13	>7.8	2-4	Low-------	0.37	1	3	<.5
	2-11	27-35	1.25-1.35	0.06-0.2	0.11-0.16	>8.4	4-16	Moderate	0.24			
	11-60	10-18	1.35-1.40	2.0-6.0	0.05-0.07	>9.0	4-16	Low-------	0.24			
102*:												
Sheppard--------	0-2	2-5	1.50-1.60	6.0-20	0.06-0.08	7.4-8.4	<2	Low-------	0.24	5	2	<.5
	2-60	3-8	1.50-1.60	6.0-20	0.06-0.08	7.4-9.0	<2	Low-------	0.20			
Moenkopie-------	0-2	2-12	1.40-1.50	6.0-20.0	0.05-0.09	7.4-9.0	<2	Low-------	0.15	1	8	<1
	2-10	7-20	1.35-1.45	2.0-6.0	0.10-0.13	7.4-9.0	<2	Low-------	0.28			
	10	---	---	---	---	---	---	----------	----			
103*:												
Sheppard--------	0-60	2-5	1.50-1.60	6.0-20	0.05-0.07	7.4-8.4	<2	Low-------	0.20	5	1	<.5
Moenkopie-------	0-6	12-18	1.35-1.45	0.6-2.0	0.10-0.14	7.4-9.0	<2	Low-------	0.20	1	8	<1
	6-9	7-20	1.35-1.45	2.0-6.0	0.10-0.13	7.4-9.0	<2	Low-------	0.28			
	9	---	---	---	---	---	---	----------	----			
104*:												
Sheppard--------	0-3	2-5	1.50-1.60	6.0-20	0.06-0.08	7.4-8.4	<2	Low-------	0.24	5	2	<.5
	3-60	3-8	1.50-1.60	6.0-20	0.06-0.08	7.4-9.0	<2	Low-------	0.20			
Pennell---------	0-3	10-15	1.35-1.45	2.0-6.0	0.10-0.20	7.9-8.4	<2	Low-------	0.37	1	3	<.5
	3-16	10-25	1.35-1.45	0.6-2.0	0.10-0.20	7.9-9.0	<2	Low-------	0.32			
	16	---	---	---	---	---	---	----------	----			
Rock outcrop.												

See footnote at end of table.

TABLE 8.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	G/cm	In/hr	In/in	pH	mmhos/cm					Pct
105*:												
Sheppard--------	0-4	2-5	1.50-1.60	6.0-20	0.06-0.08	7.4-8.4	<2	Low--------	0.24	5	2	<.5
	4-60	3-8	1.50-1.60	6.0-20	0.06-0.08	7.4-9.0	<2	Low--------	0.20			
Rock outcrop.												
106-------------- Stormitt	0-3	16-25	1.25-1.35	0.6-2.0	0.11-0.14	7.9-8.4	<2	Low--------	0.20	1	8	1-2
	3-12	27-35	1.25-1.35	0.6-2.0	0.09-0.12	7.9-8.4	<2	Moderate	0.10			
	12-60	18-27	1.25-1.35	0.6-2.0	0.08-0.10	7.9-8.4	<2	Low--------	0.10			
107-------------- Stormitt	0-3	16-25	1.25-1.35	0.6-2.0	0.07-0.09	7.9-8.4	<2	Low--------	0.20	1	8	1-2
	3-12	27-35	1.25-1.35	0.6-2.0	0.09-0.12	7.9-8.4	<2	Moderate	0.10			
	12-60	18-27	1.25-1.35	0.6-2.0	0.08-0.10	7.9-8.4	<2	Low--------	0.10			
108*:												
Stormitt--------	0-7	16-25	1.25-1.35	0.6-2.0	0.11-0.14	7.9-8.4	<2	Low--------	0.20	1	8	1-2
	7-16	27-35	1.25-1.35	0.6-2.0	0.09-0.12	7.9-8.4	<2	Moderate	0.10			
	16-60	18-27	1.25-1.35	0.6-2.0	0.08-0.10	7.9-8.4	<2	Low--------	0.10			
Rizno-----------	0-3	3-18	1.30-1.55	2.0-6.0	0.08-0.12	7.4-8.4	<2	Low--------	0.32	1	3	.5-1
	3-12	5-18	1.30-1.55	2.0-6.0	0.08-0.12	7.9-9.0	<2	Low--------	0.20			
	12	---	---	---	---	---	---	----------	----			
109-------------- Strych	0-10	16-18	1.30-1.45	2.0-6.0	0.11-0.15	7.9-9.0	<2	Low--------	0.24	2	8	.5-3
	10-60	14-18	1.45-1.60	2.0-6.0	0.06-0.11	7.9-9.0	<2	Low--------	0.20			
110*:												
Tolman----------	0-9	10-20	1.35-1.45	2.0-6.0	0.07-0.08	7.9-8.4	<2	Low--------	0.17	1	8	2-3
	9-17	18-24	1.25-1.35	0.6-2.0	0.08-0.10	7.9-8.4	<2	Low--------	0.24			
	17	---	---	---	---	---	---	----------	----			
Rock outcrop.												
111-------------- Trachute	0-3	8-12	1.45-1.55	2.0-6.0	0.08-0.11	7.9-9.0	<2	Low--------	0.17	5	2	<1
	3-60	12-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-9.0	2-4	Low--------	0.28			
112*:												
Trachute--------	0-4	8-12	1.45-1.55	2.0-6.0	0.08-0.11	7.9-9.0	<2	Low--------	0.17	5	2	<1
	4-60	12-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-9.0	2-4	Low--------	0.28			
Goblin----------	0-7	10-27	1.20-1.30	2.0-6.0	0.13-0.16	7.9-8.4	<2	Low--------	0.37	1	4L	.5-1
	7	---	---	---	---	---	---	----------	----			
113*:												
Trachute--------	0-3	8-12	1.45-1.55	2.0-6.0	0.08-0.11	7.9-9.0	<2	Low--------	0.17	5	2	<1
	3-60	12-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-9.0	2-4	Low--------	0.28			
Sheppard--------	0-60	2-5	1.50-1.60	6.0-20	0.05-0.07	7.4-8.4	<2	Low--------	0.20	5	1	<.5
114-------------- Trail	0-10	20-28	1.25-1.35	0.6-20	0.14-0.16	7.4-7.8	<4	Low--------	0.37	5	4L	.5-1
	10-60	3-15	1.40-1.50	6.0-20	0.05-0.12	7.4-9.0	<4	Low--------	0.24			
115*:												
Travessilla-----	0-7	6-13	1.45-1.60	2.0-6.0	0.10-0.14	7.4-8.4	<2	Low--------	0.15	2	8	.5-1
	7	---	---	---	---	---	---	----------	----			
Badland.												
Rock outcrop.												

See footnote at end of table.

TABLE 8.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cm	In/hr	In/in	pH	mmhos/cm					Pct
116*:												
Travessilla-----	0-6	3-13	1.45-1.60	2.0-6.0	0.09-0.13	7.4-8.4	<2	Low--------	0.28	2	3	.5-1
	6-12	8-18	1.30-1.45	0.6-6.0	0.12-0.16	7.4-9.0	<2	Low--------	0.32			
	12	---	---	---	---	---	---	-----------	----			
Rock outcrop.												
117*:												
Wayneco----------	0-3	3-7	1.40-1.50	2.0-6.0	0.04-0.08	7.9-8.4	<2	Low--------	0.15	1	1	1-2
	3-9	5-10	1.45-1.50	2.0-6.0	0.04-0.08	7.9-8.4	<2	Low--------	0.17			
	9-19	10-18	1.35-1.40	0.6-2.0	0.08-0.13	7.9-9.0	<2	Low--------	0.28			
	19	---	---	---	---	---	---	-----------	----			
Mido-------------	0-15	2-10	1.40-1.50	6.0-20	0.08-0.10	7.9-9.0	<2	Low--------	0.37	5	2	<1
	15-60	3-8	1.40-1.50	6.0-20	0.05-0.09	7.9-9.0	<2	Low--------	0.32			
118*:												
Wayneco----------	0-8	6-10	1.40-1.50	2.0-6.0	0.06-0.10	7.9-8.4	<2	Low--------	0.17	1	3	1-2
	8-16	10-18	1.35-1.40	0.6-2.0	0.08-0.13	7.9-9.0	<2	Low--------	0.28			
	16	---	---	---	---	---	---	-----------	----			
Milok------------	0-3	5-10	1.45-1.55	6.0-20	0.08-0.10	7.9-8.4	<2	Low--------	0.37	5	2	.5-1
	3-60	12-18	1.35-1.45	2.0-6.0	0.10-0.14	7.9-9.0	<4	Low--------	0.24			
Rock outcrop.												
119*:												
Wayneco----------	0-4	6-10	1.40-1.50	2.0-6.0	0.06-0.10	7.9-8.4	<2	Low--------	0.17	1	3	1-2
	4-16	10-18	1.35-1.40	0.6-2.0	0.08-0.13	7.9-9.0	<2	Low--------	0.28			
	16	---	---	---	---	---	---	-----------	----			
Rizno------------	0-1	5-18	1.30-1.55	2.0-6.0	0.08-0.12	7.4-8.4	<2	Low--------	0.20	1	8	.5-1
	1-7	5-18	1.30-1.55	2.0-6.0	0.08-0.12	7.9-9.0	<2	Low--------	0.20			
	7	---	---	---	---	---	---	-----------	----			
Rock outcrop.												
120*:												
Windwhistle------	0-2	3-8	1.40-1.50	6.0-20	0.08-0.10	7.4-8.4	<2	Low--------	0.49	3	2	1-3
	2-28	13-18	1.40-1.55	2.0-6.0	0.12-0.16	7.4-9.0	<2	Low--------	0.43			
	28	---	---	---	---	---	---	-----------	----			
Rock outcrop.												
121--------------- Yarts	0-8	10-18	1.35-1.40	2.0-6.0	0.10-0.14	7.4-8.4	<2	Low--------	0.20	5	3	<2
	8-60	10-18	1.35-1.40	2.0-6.0	0.10-0.14	7.4-8.4	<2	Low--------	0.20			
122--------------- Yarts	0-3	10-18	1.35-1.40	2.0-6.0	0.10-0.14	7.4-8.4	<2	Low--------	0.20	5	3	<2
	3-60	10-18	1.35-1.40	2.0-6.0	0.10-0.14	7.4-8.4	<2	Low--------	0.20			
123*:												
Yarts------------	0-3	5-10	1.45-1.55	6.0-20	0.08-0.11	7.4-8.4	<2	Low--------	0.24	4	2	<2
	3-48	10-18	1.35-1.40	2.0-6.0	0.10-0.14	7.4-9.0	<2	Low--------	0.28			
	48	---	---	---	---	---	---	-----------	----			
Mido-------------	0-15	2-10	1.40-1.50	6.0-20	0.08-0.10	7.9-9.0	<2	Low--------	0.37	5	2	<1
	15-60	3-8	1.40-1.50	6.0-20	0.05-0.09	7.9-9.0	<2	Low--------	0.32			
124*:												
Yarts------------	0-3	5-10	1.45-1.55	6.0-20	0.08-0.11	7.4-8.4	<2	Low--------	0.24	4	2	<2
	3-54	10-18	1.35-1.40	2.0-6.0	0.10-0.14	7.4-9.0	<2	Low--------	0.28			
	54	---	---	---	---	---	---	-----------	----			
Mido-------------	0-15	2-10	1.40-1.50	6.0-20	0.08-0.10	7.9-9.0	<2	Low--------	0.37	5	2	<1
	15-60	3-8	1.40-1.50	6.0-20	0.05-0.09	7.9-9.0	<2	Low--------	0.32			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--SOIL AND WATER FEATURES

["Flooding" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydro-logic group	Flooding			Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Hard-ness	Depth	Thick-ness		Uncoated steel	Concrete
					In		In				
1*. Badland											
2*:											
Badland.											
Hanksville	D	None	---	---	20-40	Soft	---	---	Low	High	High.
3*:											
Badland.											
Rock outcrop.											
4, 5 Begay	B	None	---	---	>60	---	---	---	Low	High	Moderate.
6*:											
Begay	B	None	---	---	>60	---	---	---	Low	High	Moderate.
Mellenthin	D	None	---	---	10-20	Hard	---	---	Low	High	Moderate.
7*:											
Begay	B	None	---	---	>60	---	---	---	Low	High	Moderate.
Mido	A	None	---	---	>60	---	---	---	Low	High	Moderate.
8*:											
Begay	B	None	---	---	>60	---	---	---	Low	High	Moderate.
Rizno	D	None	---	---	4-20	Hard	---	---	Low	High	Moderate.
9 Billings	C	Rare	---	---	>60	---	---	---	High	High	High.
10 Billings	C	None	---	---	>60	---	---	---	High	High	High.
11 Billings	C	Rare	---	---	>60	---	---	---	High	High	High.
12 Billings Variant	D	None	---	---	>60	---	---	---	Moderate	High	High.
13, 14, 15 Blackston	B	None	---	---	>60	---	---	---	Low	High	Moderate.
16*:											
Blackston	B	None	---	---	>60	---	---	---	Low	High	Moderate.
Leebench	D	None	---	---	>60	---	---	---	Low	High	High.
17 Bowdish	C	None	---	---	20-40	Soft	---	---	Moderate	High	Moderate.
18*:											
Bowdish	C	None	---	---	20-40	Soft	---	---	Moderate	High	Moderate.
Mido	A	None	---	---	>60	---	---	---	Low	High	Moderate.

See footnote at end of table.

TABLE 9.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Hard-ness	Depth	Thick-ness		Uncoated steel	Concrete
					In		In				
19----------------- Bowdish Variant	B	None---------	---	---	40-60	Hard	---	---	Moderate	High-----	Moderate.
20*: Canyon family----	D	None---------	---	---	5-20	Soft	---	---	Low------	High-----	Moderate.
Rock outcrop.											
21*: Cerrillos--------	B	None---------	---	---	>60	---	---	---	Moderate	High-----	Moderate.
Chipeta----------	D	None---------	---	---	5-20	Soft	---	---	Low------	High-----	High.
22----------------- Cerrillos Variant	C	None---------	---	---	20-40	Hard	---	---	Low------	High-----	High.
23, 24------------ Chipeta	D	None---------	---	---	5-20	Soft	---	---	Low------	High-----	High.
25*: Chipeta----------	D	None---------	---	---	5-20	Soft	---	---	Low------	High-----	High.
Badland.											
26*: Chipeta Variant--	C	None---------	---	---	20-40	Soft	---	---	Moderate	High-----	Moderate.
Badland.											
Rock outcrop.											
27*: Circleville------	C	None---------	---	---	20-40	Hard	---	---	Moderate	High-----	Moderate.
Blazon-----------	D	None---------	---	---	10-20	Soft	---	---	Moderate	High-----	Moderate.
28----------------- Delson	C	None---------	---	---	>60	---	---	---	Moderate	Moderate	Low.
29*: Delson-----------	C	None---------	---	---	>60	---	---	---	Moderate	Moderate	Low.
Datino family----	C	None---------	---	---	20-40	Soft	---	---	Moderate	Moderate	Low.
30*: Delson-----------	C	None---------	---	---	>60	---	---	---	Moderate	Moderate	Low.
Makoti family----	C	None---------	---	---	40-60	Soft	---	---	Moderate	High-----	Moderate.
31*: Duneland.											
Mido-------------	A	None---------	---	---	>60	---	---	---	Low------	High-----	Moderate.
32----------------- Factory	C	None---------	---	---	>60	---	20-40	Thick	Moderate	High-----	Moderate.
33----------------- Farb	D	None---------	---	---	4-20	Hard	---	---	Low------	High-----	Moderate.
34*: Farb-------------	D	None---------	---	---	4-20	Hard	---	---	Low------	High-----	Moderate.
Rock outcrop.											

See footnote at end of table.

TABLE 9.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	Bedrock: Depth	Bedrock: Hard-ness	Cemented pan: Depth	Cemented pan: Thick-ness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					In		In				
35*:											
Farb	D	None	---	---	4-20	Hard	---	---	Low	High	Moderate.
Farb, very shallow	D	None	---	---	4-20	Hard	---	---	Low	High	Moderate.
Rock outcrop.											
36* Glenberg family	B	None	---	---	>60	---	---	---	Low	High	Moderate.
37*:											
Goblin	D	None	---	---	5-20	Soft	---	---	Low	High	High.
Chipeta	D	None	---	---	5-20	Soft	---	---	Low	High	High.
38*:											
Green River family	C	Occasional	Very brief	Jun-Sep	>60	---	---	---	Low	High	Moderate.
Myton family extremely bouldery loam	B	None	---	---	>60	---	---	---	Low	High	Moderate.
Myton family gravelly sandy loam	B	None	---	---	>60	---	---	---	Low	High	Moderate.
39*:											
Hanksville	D	None	---	---	20-40	Soft	---	---	Low	High	High.
Chipeta	D	None	---	---	5-20	Soft	---	---	Low	High	High.
40 Haverdad	B	Occasional	Very brief	Apr-Sep	>60	---	---	---	Moderate	High	Moderate.
41, 42 Jocity	B	None	---	---	>60	---	---	---	Moderate	High	Low.
43 Leebench	D	None	---	---	>60	---	---	---	Low	High	High.
44*:											
Leebench	D	None	---	---	>60	---	---	---	Low	High	High.
Hanksville	D	None	---	---	20-40	Soft	---	---	Low	High	High.
45*:											
Mellenthin	D	None	---	---	10-20	Hard	---	---	Low	High	Moderate.
Rock outcrop.											
Mido	A	None	---	---	>60	---	---	---	Low	High	Moderate.
46 Mido	A	None	---	---	>60	---	---	---	Low	High	Moderate.
47*:											
Mido	A	None	---	---	>60	---	---	---	Low	High	Moderate.
Wayneco	D	None	---	---	10-20	Hard	---	---	Low	High	Moderate.
Milok	B	None	---	---	>60	---	---	---	Low	High	High.

See footnote at end of table.

TABLE 9.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Hard-ness	Depth	Thick-ness		Uncoated steel	Concrete
					In		In				
48, 49 Milok	B	None	---	---	>60	---	---	---	Low	High	High.
50*:											
Milok	B	None	---	---	>60	---	---	---	Low	High	High.
Begay	B	None	---	---	>60	---	---	---	Low	High	Moderate.
51*:											
Milok	B	None	---	---	>60	---	---	---	Low	High	High.
Chipeta	D	None	---	---	5-20	Soft	---	---	Low	High	High.
52*:											
Milok	B	None	---	---	>60	---	---	---	Low	High	High.
Mido	A	None	---	---	>60	---	---	---	Low	High	Moderate.
53*:											
Milok	B	None	---	---	>60	---	---	---	Low	High	High.
Pastern	D	None	---	---	>60	---	7-20	Thick	Low	High	Moderate.
54 Mivida	B	None	---	---	>60	---	---	---	Low	High	Moderate.
55*:											
Mivida	B	None	---	---	>60	---	---	---	Low	High	Moderate.
Goblin	D	None	---	---	5-20	Soft	---	---	Low	High	High.
56 Mivida Variant	B	None	---	---	40-60	Soft	---	---	Low	High	Moderate.
57 Moenkopie	D	None	---	---	3-20	Hard	---	---	Low	High	High.
58*:											
Moenkopie	D	None	---	---	3-20	Hard	---	---	Low	High	High.
Chipeta	D	None	---	---	5-20	Soft	---	---	Low	High	High.
59*:											
Moenkopie fine sandy loam	D	None	---	---	3-20	Hard	---	---	Low	High	High.
Moenkopie channery sandy loam	D	None	---	---	3-20	Hard	---	---	Low	High	High.
Rock outcrop.											
60, 61 Moffat	B	None	---	---	>60	---	---	---	Low	High	Moderate.
62*:											
Moffat	B	None	---	---	>60	---	---	---	Low	High	Moderate.
Sheppard	A	None	---	---	>60	---	---	---	Low	High	Moderate.
63* Montosa family	B	None	---	---	>60	---	---	---	Moderate	High	Moderate.

See footnote at end of table.

TABLE 9.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	Bedrock: Depth	Bedrock: Hard-ness	Cemented pan: Depth	Cemented pan: Thick-ness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					In		In				
64 Monue	B	None	---	---	>60	---	---	---	Low	High	Moderate.
65*:											
Monue Variant	C	None	---	---	20-40	Hard	---	---	Low	High	Moderate.
Farb	D	None	---	---	4-20	Hard	---	---	Low	High	Moderate.
Rock outcrop.											
66*:											
Myton family	B	None	---	---	>60	---	---	---	Low	High	Moderate.
Travessilla	D	None	---	---	4-20	Hard	---	---	Moderate	High	Moderate.
Rock outcrop.											
67* Olnes family	C	None	---	---	>20	Hard	---	---	Moderate	Moderate	Moderate.
68*:											
Olnes family	C	None	---	---	>20	Hard	---	---	Moderate	Moderate	Moderate.
Pando family	B	None	---	---	40-60	Soft	---	---	Moderate	High	Moderate.
69*:											
Otero family	B	None	---	---	>60	---	---	---	Low	High	Moderate.
Glenberg family	B	Rare	---	---	>60	---	---	---	Low	High	Moderate.
70 Palma	B	None	---	---	>60	---	---	---	Low	High	Moderate.
71*:											
Pando family	B	None	---	---	40-60	Soft	---	---	Moderate	High	Moderate.
Rogert	D	None	---	---	10-20	Hard	---	---	Moderate	Moderate	Low.
72 Pastern	D	None	---	---	>60	---	7-20	Thick	Low	High	Moderate.
73 Pennell	D	None	---	---	10-20	Hard	---	---	Low	High	Moderate.
74*, 75*:											
Pennell	D	None	---	---	10-20	Hard	---	---	Low	High	Moderate.
Moenkopie	D	None	---	---	3-20	Hard	---	---	Low	High	High.
Rock outcrop.											
76*:											
Redcreek	D	None	---	---	10-20	Hard	---	---	Low	High	Moderate.
Windwhistle Variant	C	None	---	---	20-40	Hard	---	---	Moderate	High	Moderate.
77*. Riverwash											
78*:											
Riverwash.											
Glenberg family	B	Rare	---	---	>60	---	---	---	Low	High	Moderate.

See footnote at end of table.

TABLE 9.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Hard-ness	Depth	Thick-ness		Uncoated steel	Concrete
					In		In				
78*:											
Green River family----------	C	Occasional	Very brief	Jun-Sep	>60	---	---	---	Low------	High-----	Moderate.
79*:											
Riverwash.											
Neskahi family---	B	None--------	---	---	>60	---	---	---	Low------	High-----	Moderate.
80---------------- Rizno	D	None--------	---	---	4-20	Hard	---	---	Low------	High-----	Moderate.
81*:											
Rizno------------	D	None--------	---	---	4-20	Hard	---	---	Low------	High-----	Moderate.
Mido-------------	A	None--------	---	---	>60	---	---	---	Low------	High-----	Moderate.
82*, 83*:											
Rizno------------	D	None--------	---	---	4-20	Hard	---	---	Low------	High-----	Moderate.
Rock outcrop.											
84*, 85*:											
Robroost---------	B	None--------	---	---	>60	---	---	---	Low------	High-----	High.
Goblin-----------	D	None--------	---	---	5-20	Soft	---	---	Low------	High-----	High.
86*.											
Rock outcrop											
87*:											
Rock outcrop.											
Arches-----------	D	None--------	---	---	10-20	Hard	---	---	Low------	High-----	Low.
88*:											
Rock outcrop.											
Chipeta----------	D	None--------	---	---	5-20	Soft	---	---	Low------	High-----	High.
89*:											
Rock outcrop.											
Chipeta----------	D	None--------	---	---	5-20	Soft	---	---	Low------	High-----	High.
Canyon family----	D	None--------	---	---	5-20	Soft	---	---	Low------	High-----	Moderate.
90*:											
Rock outcrop.											
Farb-------------	D	None--------	---	---	4-20	Hard	---	---	Low------	High-----	Moderate.
91*:											
Rock outcrop.											
Montosa family---	B	None--------	---	---	>60	---	---	---	Moderate	High-----	Moderate.
92*:											
Rock outcrop.											
Stormitt---------	B	None--------	---	---	>60	---	---	---	Low------	High-----	Moderate.
Rizno------------	D	None--------	---	---	4-20	Hard	---	---	Low------	High-----	Moderate.

See footnote at end of table.

TABLE 9.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Hard-ness	Depth	Thick-ness		Uncoated steel	Concrete
					In		In				
93*, 94*: Rock outcrop.											
Travessilla	D	None	---	---	4-20	Hard	---	---	Moderate	High	Moderate.
95*: Rogert	D	None	---	---	10-20	Hard	---	---	Moderate	Moderate	Low.
Rogert Variant	D	None	---	---	10-20	Hard	---	---	Moderate	Moderate	Low.
96*. Rubble land											
97*: Shedado loamy fine sand	C	None	---	---	20-40	Hard	---	---	Low	High	Moderate.
Shedado fine sandy loam	C	None	---	---	20-40	Hard	---	---	Low	High	Moderate.
98, 99 Sheppard	A	None	---	---	>60	---	---	---	Low	High	Moderate.
100*: Sheppard	A	None	---	---	>60	---	---	---	Low	High	Moderate.
Goblin	D	None	---	---	5-20	Soft	---	---	Low	High	High.
101*: Sheppard	A	None	---	---	>60	---	---	---	Low	High	Moderate.
Leebench	D	None	---	---	>60	---	---	---	Low	High	High.
102*, 103*: Sheppard	A	None	---	---	>60	---	---	---	Low	High	Moderate.
Moenkopie	D	None	---	---	3-20	Hard	---	---	Low	High	High.
104*: Sheppard	A	None	---	---	>60	---	---	---	Low	High	Moderate.
Pennell	D	None	---	---	10-20	Hard	---	---	Low	High	Moderate.
Rock outcrop.											
105*: Sheppard	A	None	---	---	>60	---	---	---	Low	High	Moderate.
Rock outcrop.											
106, 107 Stormitt	B	None	---	---	>60	---	---	---	Low	High	Moderate.
108*: Stormitt	B	None	---	---	>60	---	---	---	Low	High	Moderate.
Rizno	D	None	---	---	4-20	Hard	---	---	Low	High	Moderate.
109 Strych	B	None	---	---	>60	---	---	---	Moderate	High	Moderate.
110*: Tolman	D	None	---	---	10-20	Hard	---	---	Moderate	High	Moderate.

See footnote at end of table.

TABLE 9.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Hard-ness	Depth	Thick-ness		Uncoated steel	Concrete
					In		In				
110*: Rock outcrop.											
111 Trachute	B	None	---	---	>60	---	---	---	Low	High	High.
112*: Trachute	B	None	---	---	>60	---	---	---	Low	High	High.
Goblin	D	None	---	---	5-20	Soft	---	---	Low	High	High.
113*: Trachute	B	None	---	---	>60	---	---	---	Low	High	High.
Sheppard	A	None	---	---	>60	---	---	---	Low	High	Moderate.
114 Trail	A	None	---	---	>60	---	---	---	Low	High	Moderate.
115*: Travessilla	D	None	---	---	4-20	Hard	---	---	Moderate	High	Moderate.
Badland.											
Rock outcrop.											
116*: Travessilla	D	None	---	---	4-20	Hard	---	---	Moderate	High	Moderate.
Rock outcrop.											
117*: Wayneco	D	None	---	---	10-20	Hard	---	---	Low	High	Moderate.
Mido	A	None	---	---	>60	---	---	---	Low	High	Moderate.
118*: Wayneco	D	None	---	---	10-20	Hard	---	---	Low	High	Moderate.
Milok	B	None	---	---	>60	---	---	---	Low	High	High.
Rock outcrop.											
119*: Wayneco	D	None	---	---	10-20	Hard	---	---	Low	High	Moderate.
Rizno	D	None	---	---	4-20	Hard	---	---	Low	High	Moderate.
Rock outcrop.											
120*: Windwhistle	C	None	---	---	20-40	Hard	---	---	Moderate	High	Moderate.
Rock outcrop.											
121, 122 Yarts	B	None	---	---	>60	---	---	---	Moderate	High	Moderate.
123*, 124*: Yarts	B	None	---	---	40-60	Hard	---	---	Moderate	High	Moderate.
Mido	A	None	---	---	>60	---	---	---	Low	High	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Arches	Mixed, mesic Lithic Torripsamments
Begay	Coarse-loamy, mixed, mesic Ustollic Camborthids
Billings	Fine-silty, mixed (calcareous), mesic Typic Torrifluvents
Billings Variant	Fine, mixed (calcareous), mesic Typic Torrifluvents
Blackston	Loamy-skeletal, mixed, mesic Typic Calciorthids
Blazon	Loamy, mixed (calcareous), frigid, shallow Ustic Torriorthents
Bowdish	Fine-loamy, mixed, mesic Ustollic Calciorthids
Bowdish Variant	Fine-loamy, mixed, mesic Ustollic Calciorthids
Canyon family	Loamy, mixed (calcareous), mesic, shallow Ustic Torriorthents
Cerrillos	Fine-loamy, mixed, mesic Ustollic Haplargids
Cerrillos Variant	Fine-loamy, mixed, mesic Typic Haplargids
Chipeta	Clayey, mixed (calcareous), mesic, shallow Typic Torriorthents
Chipeta Variant	Fine, mixed (calcareous), mesic Ustic Torriorthents
Circleville	Loamy-skeletal, mixed Aridic Argiborolls
Datino family	Loamy-skeletal, mixed Typic Haploborolls
Delson	Fine, montmorillonitic Typic Argiborolls
Factory	Coarse-loamy, carbonatic, mesic Ustollic Paleorthids
Farb	Loamy, mixed (calcareous), mesic Lithic Torriorthents
Glenberg family	Coarse-loamy, mixed (calcareous), mesic Ustic Torrifluvents
Goblin	Loamy, gypsic, mesic, shallow Typic Torriorthents
Green River family	Coarse-loamy, mixed (calcareous), mesic Aquic Ustifluvents
Hanksville	Fine, mixed (calcareous), mesic Typic Torriorthents
Haverdad	Fine-loamy, mixed (calcareous), mesic Ustic Torrifluvents
Jocity	Fine-loamy, mixed (calcareous), mesic Typic Torrifluvents
Leebench	Fine-loamy, mixed, mesic Typic Natrargids
Makoti family	Fine-silty, mixed Pachic Haploborolls
Mellenthin	Loamy-skeletal, mixed, mesic Lithic Ustollic Calciorthids
Mido	Mixed, mesic Ustic Torripsamments
Milok	Coarse-loamy, mixed, mesic Ustollic Calciorthids
Mivida	Coarse-loamy, mixed, mesic Ustollic Calciorthids
Mivida Variant	Coarse-loamy, mixed, mesic Ustollic Calciorthids
Moenkopie	Loamy, mixed (calcareous), mesic Lithic Torriorthents
Moffat	Coarse-loamy, mixed, mesic Typic Calciorthids
Montosa family	Loamy-skeletal, mixed, mesic Aridic Argiustolls
Monue	Coarse-loamy, mixed, mesic Typic Camborthids
Monue Variant	Coarse-loamy, mixed, mesic Typic Haplargids
Myton family	Loamy-skeletal, mixed (calcareous), mesic Typic Torriorthents
Neskahi family	Coarse-loamy, mixed (calcareous), mesic Typic Torrifluvents
Olnes family	Loamy-skeletal, mixed, nonacid Typic Cryorthents
Otero family	Coarse-loamy, mixed (calcareous), mesic Ustic Torriorthents
Palma	Coarse-loamy, mixed, mesic Ustollic Haplargids
Pando family	Loamy-skeletal, mixed Boralfic Cryoborolls
Pastern	Loamy, mixed, mesic, shallow Ustollic Paleorthids
Pennell	Loamy, mixed, mesic Lithic Calciorthids
Redcreek	Loamy, mixed (calcareous), frigid Lithic Ustic Torriorthents
Rizno	Loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents
Robroost	Coarse-loamy, mixed, mesic Cambic Gypsiorthids
Rogert	Loamy-skeletal, mixed Lithic Cryoborolls
Rogert Variant	Loamy-skeletal, mixed, shallow Typic Cryoborolls
Shedado	Coarse-loamy, mixed (calcareous), mesic Ustic Torriorthents
Sheppard	Mixed, mesic Typic Torripsamments
Stormitt	Loamy-skeletal, carbonatic, mesic Ustollic Calciorthids
Strych	Loamy-skeletal, mixed, mesic Ustollic Calciorthids
Tolman	Loamy-skeletal, mixed Lithic Argiborolls
Trachute	Coarse-loamy, mixed (calcareous), mesic Typic Torriorthents
Trail	Sandy, mixed, mesic Typic Torrifluvents
Travessilla	Loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents
Wayneco	Loamy, mixed, mesic Lithic Ustollic Calciorthids
Windwhistle	Coarse-loamy, mixed, mesic Ustollic Haplargids
Windwhistle Variant	Coarse-loamy, mixed, frigid Ustollic Haplargids
Yarts	Coarse-loamy, mixed (calcareous), mesic Ustic Torriorthents

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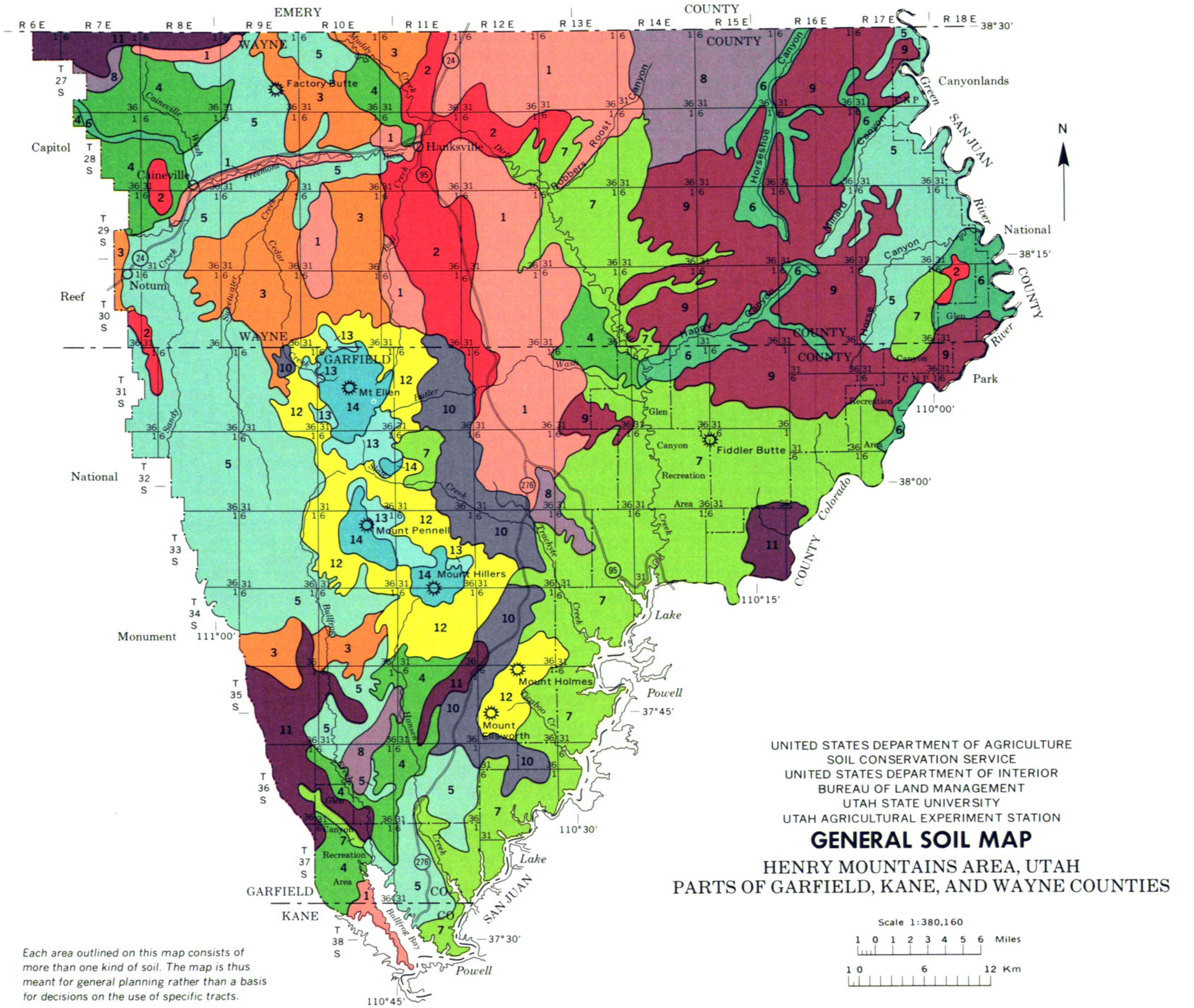


UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
UTAH STATE UNIVERSITY
UTAH AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

HENRY MOUNTAINS AREA, UTAH
PARTS OF GARFIELD, KANE, AND WAYNE COUNTIES

Scale 1:380,160

1 0 1 2 3 4 5 6 Miles

1 0 6 12 Km

LEGEND

DOMINANTLY VERY DEEP TO SHALLOW, WELL DRAINED AND SOMEWHAT EXCESSIVELY DRAINED, GENTLY SLOPING TO VERY STEEP SOILS IN THE ARID CLIMATIC ZONE

1 Moffat-Sheppard-Blackston: Very deep, well drained and somewhat excessively drained, gently sloping to steep soils; on benches, alluvial fans, upland terraces, and hillsides and in valleys

2 Robroost-Sheppard-Goblin: Shallow and very deep, well drained and somewhat excessively drained, gently sloping to steep soils; on alluvial fans, benches, hillsides, and upland pediment surfaces and in valleys

3 Chipeta-Hanksville-Leebench: Shallow, moderately deep, and very deep, well drained, nearly level to very steep soils; on mesas, benches, hillsides, alluvial fans, and fan terraces

DOMINANTLY SHALLOW AND VERY SHALLOW, WELL DRAINED AND EXCESSIVELY DRAINED, GENTLY SLOPING TO VERY STEEP SOILS AND ROCK OUTCROP IN THE ARID AND SEMIARID CLIMATIC ZONE

4 Farb-Pennell-Moenkopie: Shallow, well drained and excessively drained, gently sloping to very steep soils; on benches, mesas, and hillsides

5 Badland-Rock outcrop-Chipeta: Badland, Rock outcrop, and shallow, well drained, gently sloping to very steep soils; on mesas, benches, and hillsides

6 Rock outcrop-Moenkopie-Arches: Rock outcrop, and shallow, well drained, gently sloping to steep soils; on benches, mesas, old pediment surfaces, and hillsides

7 Rock outcrop: Exposed areas of hard bedrock

DOMINANTLY VERY DEEP, MODERATELY DEEP, AND SHALLOW, WELL DRAINED AND EXCESSIVELY DRAINED, NEARLY LEVEL TO VERY STEEP SOILS IN THE SEMIARID CLIMATIC ZONE

8 Milok-Wayneco-Mido: Very deep and shallow, well drained and excessively drained, nearly level to steep soils; on mesas, benches, ridges, fan terraces, and hillsides and in valleys

9 Begay-Mido-Mellenthin: Shallow and very deep, well drained and excessively drained, gently sloping to moderately steep soils; on mesas, benches, alluvial fans, and hillsides and in valleys

10 Travessilla-Yarts-Shedado: Shallow, moderately deep, and very deep, well drained, nearly level to very steep soils; on mesas, benches, hillsides, and alluvial fans

11 Rizno-Chipeta-Begay: Shallow and very deep, well drained, gently sloping soils; on mesas, benches, ridges, alluvial fans, and hillsides and in valleys

DOMINANTLY SHALLOW, MODERATELY DEEP, AND VERY DEEP, WELL DRAINED, SLOPING TO VERY STEEP SOILS IN THE DRY SUBHUMID CLIMATIC ZONE

12 Montosa family-Circleville-Blazon: Shallow, moderately deep, and very deep, well drained, sloping to very steep soils; on fans, fan terraces, benches, and mountainsides

DOMINANTLY VERY DEEP TO SHALLOW, WELL DRAINED, MODERATELY STEEP TO VERY STEEP SOILS IN THE HUMID CLIMATIC ZONE

13 Delson-Datino family-Makoti family: Moderately deep to very deep, well drained, moderately steep to very steep soils; on mountainsides

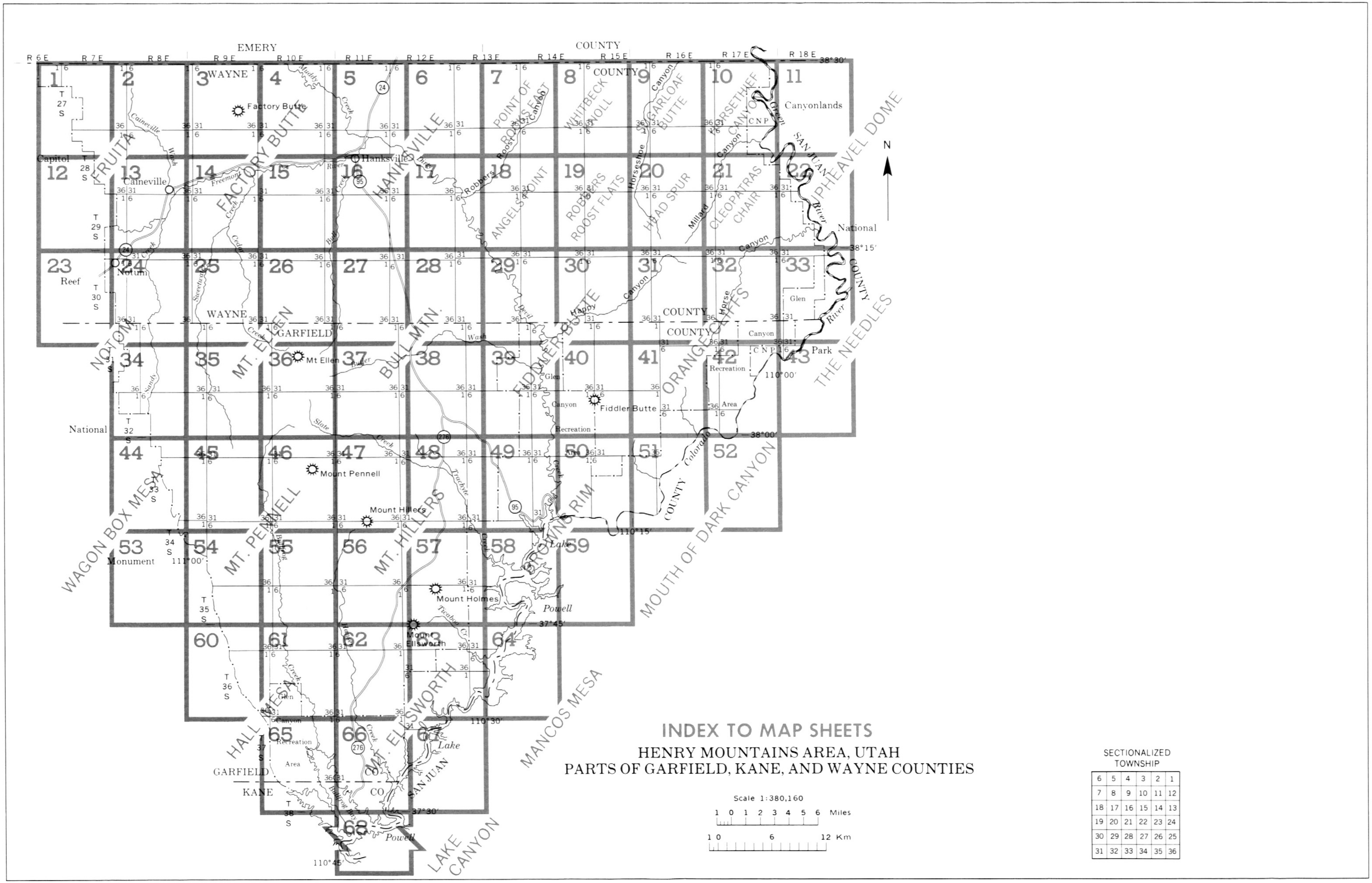
14 Pando family-Rogert-Olnes family: Deep and shallow, well drained, very steep soils; on mountainsides

COMPILED 1987

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



INDEX TO MAP SHEETS

HENRY MOUNTAINS AREA, UTAH

PARTS OF GARFIELD, KANE, AND WAYNE COUNTIES

Scale 1:380,160

SOIL LEGEND

SYMBOL	NAME
1	Badland
2	Badland-Hanksville complex
3	Badland-Rock outcrop complex
4	Begay loamy fine sand, 2 to 8 percent slopes
5	Begay fine sandy loam, 2 to 8 percent slopes
6	Begay-Mellenthin complex
7	Begay-Mido complex
8	Begay-Rizno complex
9	Billings silt loam
10	Billings silty clay loam
11	Billings silty clay loam, saline-alkali
12	Billings Variant clay
13	Blackston fine sandy loam
14	Blackston gravelly fine sandy loam, 4 to 8 percent slopes
15	Blackston gravelly fine sandy loam, 8 to 30 percent slopes
16	Blackston-Leebench complex
17	Bowdish loamy fine sand, 4 to 8 percent slopes
18	Bowdish-Mido complex
19	Bowdish Variant fine sandy loam
20	Canyon family-Rock outcrop complex
21	Cerrillos-Chipeta complex
22	Cerrillos Variant loam
23	Chipeta silty clay, 2 to 15 percent slopes
24	Chipeta gravelly silty clay, 30 to 60 percent slopes
25	Chipeta-Badland complex
26	Chipeta Variant-Badland-Rock outcrop complex
27	Circleville-Blazon complex
28	Delson cobbly loam, 15 to 30 percent slopes
29	Delson-Datino family complex
30	Delson-Makoti family complex
31	Duneland-Mido complex
32	Factory sandy loam, 2 to 8 percent slopes
33	Farb fine sandy loam, 4 to 15 percent slopes
34	Farb-Rock outcrop complex
35	Farb-Farb, very shallow-rock outcrop complex
36	Glenberg family fine sandy loam
37	Goblin-Chipeta complex
38	Green River-Myton families complex
39	Hanksville-Chipeta complex
40	Haverdad silt loam
41	Jocity loam
42	Jocity clay
43	Leebench gravelly clay loam, 4 to 8 percent slopes
44	Leebench-Hanksville complex
45	Mellenthin-Rock outcrop-Mido complex
46	Mido loamy fine sand, 4 to 15 percent slopes
47	Mido-Wayneco-Milok complex
48	Milok loamy fine sand, 4 to 8 percent slopes
49	Milok sandy loam
50	Milok-Begay complex
51	Milok-Chipeta complex
52	Milok-Mido complex
53	Milok-Pastern complex
54	Mivida loamy fine sand
55	Mivida-Goblin complex
56	Mivida Variant very cobbly very fine sandy loam, 15 to 40 percent slopes
57	Moenkopie fine sandy loam
58	Moenkopie-Chipeta complex
59	Moenkopie-Rock outcrop complex
60	Moffat loamy fine sand, 2 to 8 percent slopes
61	Moffat loamy fine sand, 8 to 15 percent slopes
62	Moffat-Sheppard complex
63	Montosa family, cobbly very fine sandy loam, 4 to 8 percent slopes
64	Monue loamy fine sand
65	Monue Variant-Farb-Rock outcrop complex
66	Myton family-Travessilla-Rock outcrop complex
67	Olnes family cobbly loam, 50 to 70 percent slopes
68	Olnes-Pando families complex
69	Otero-Glenberg families complex
70	Palma very fine sandy loam
71	Pando family-Rogert complex
72	Pastern cobbly fine sandy loam, 2 to 15 percent slopes
73	Pennell fine sandy loam, 2 to 8 percent slopes
74	Pennell-Moenkopie-Rock outcrop complex, 2 to 15 percent slopes
75	Pennell-Moenkopie-Rock outcrop complex, 15 to 50 percent slopes
76	Redcreek-Windwhistle Variant, complex
77	Riverwash
78	Riverwash-Glenberg-Green River families complex
79	Riverwash-Neskahi family complex
80	Rizno fine sandy loam, 4 to 15 percent slopes
81	Rizno-Mido complex
82	Rizno-Rock outcrop complex
83	Rizno, warm-rock outcrop complex
84	Robroost-Goblin complex
85	Robroost-Goblin complex, eroded
86	Rock outcrop
87	Rock outcrop-Arches complex
88	Rock outcrop-Chipeta complex
89	Rock outcrop-Chipeta-Canyon family complex
90	Rock outcrop-Farb complex
91	Rock outcrop-Montosa family complex
92	Rock outcrop-Stormitt-Rizno complex
93	Rock outcrop-Travessilla complex
94	Rock outcrop-Travessilla, warm complex
95	Rogert-Rogert Variant complex
96	Rubbleland
97	Shedado complex
98	Sheppard sand, 2 to 8 percent slopes
99	Sheppard loamy fine sand, 2 to 8 percent slopes
100	Sheppard-Goblin complex
101	Sheppard-Leebench complex
102	Sheppard-Moenkopie complex
103	Sheppard-Moenkopie, warm complex
104	Sheppard-Pennell-Rock outcrop complex
105	Sheppard-Rock outcrop complex
106	Stormitt gravelly loam, 2 to 15 percent slopes
107	Stormitt extremely bouldery loam, 4 to 30 percent slopes
108	Stormitt-Rizno complex
109	Strych gravelly fine sandy loam, 2 to 15 percent slopes
110	Tolman-Rock outcrop complex
111	Trachute loamy fine sand, 2 to 8 percent slopes
112	Trachute-Goblin complex
113	Trachute-Sheppard complex
114	Trail loam
115	Travessilla-Badland-Rock outcrop complex
116	Travessilla-Rock outcrop complex
117	Wayneco-Mido complex
118	Wayneco-Milok-Rock outcrop complex
119	Wayneco-Rizno-Rock outcrop complex
120	Windwhistle-Rock outcrop complex
121	Yarts fine sandy loam, 1 to 3 percent slopes
122	Yarts fine sandy loam, 3 to 8 percent slopes
123	Yarts-Mido complex
124	Yarts-Mido, complex, eroded

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline and neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool

STATE COORDINATE TICK

LAND DIVISION CORNER (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate
- Federal
- State
- County, farm or ranch

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or Small

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label)
- Located object (label)
- Tank (label)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial
- Intermittent

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot

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1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

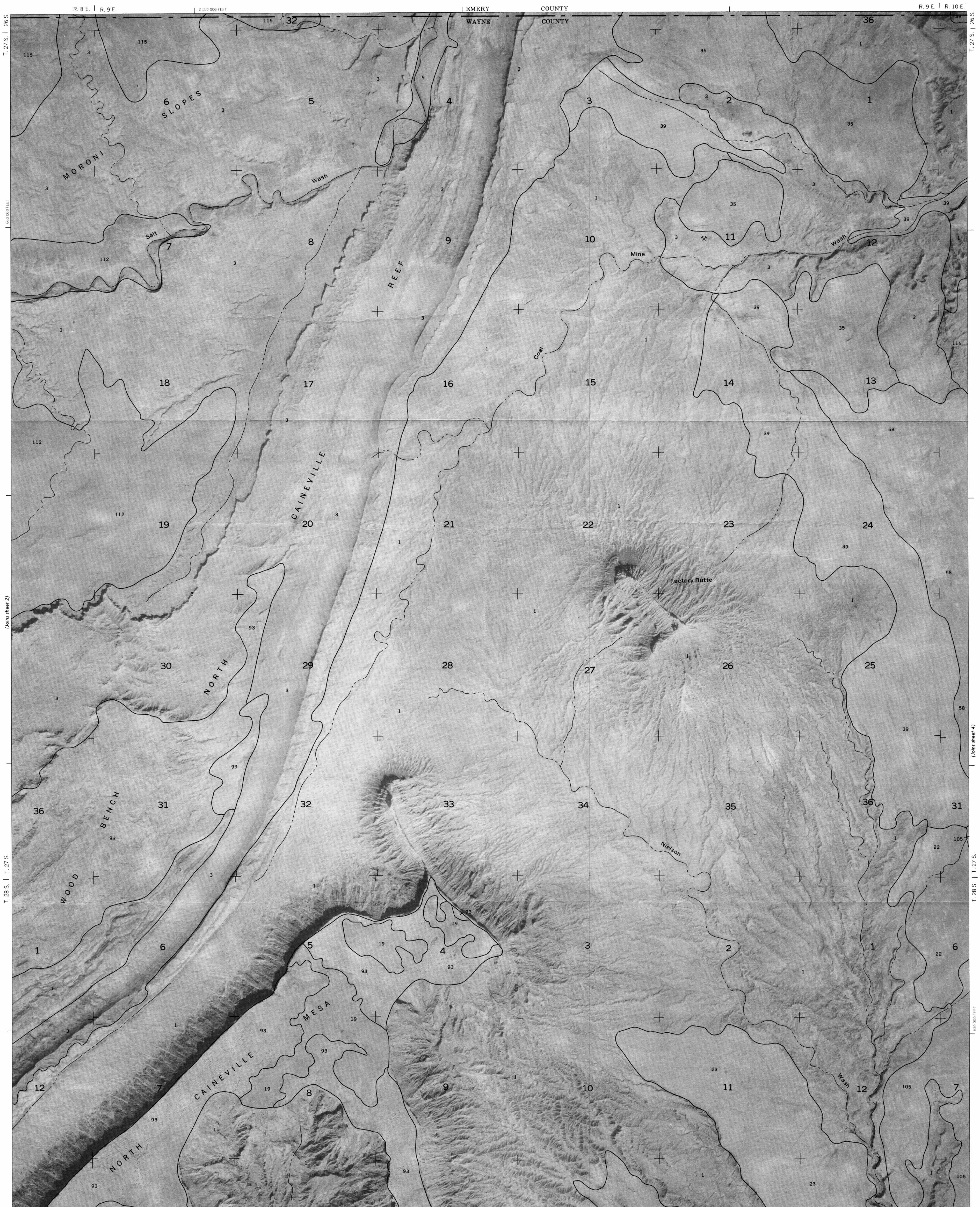
SCALE 1:24 000

N

HENRY MOUNTAINS AREA — UTAH NO. 1

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

HENRY MOUNTAINS AREA — UTAH NO. 2

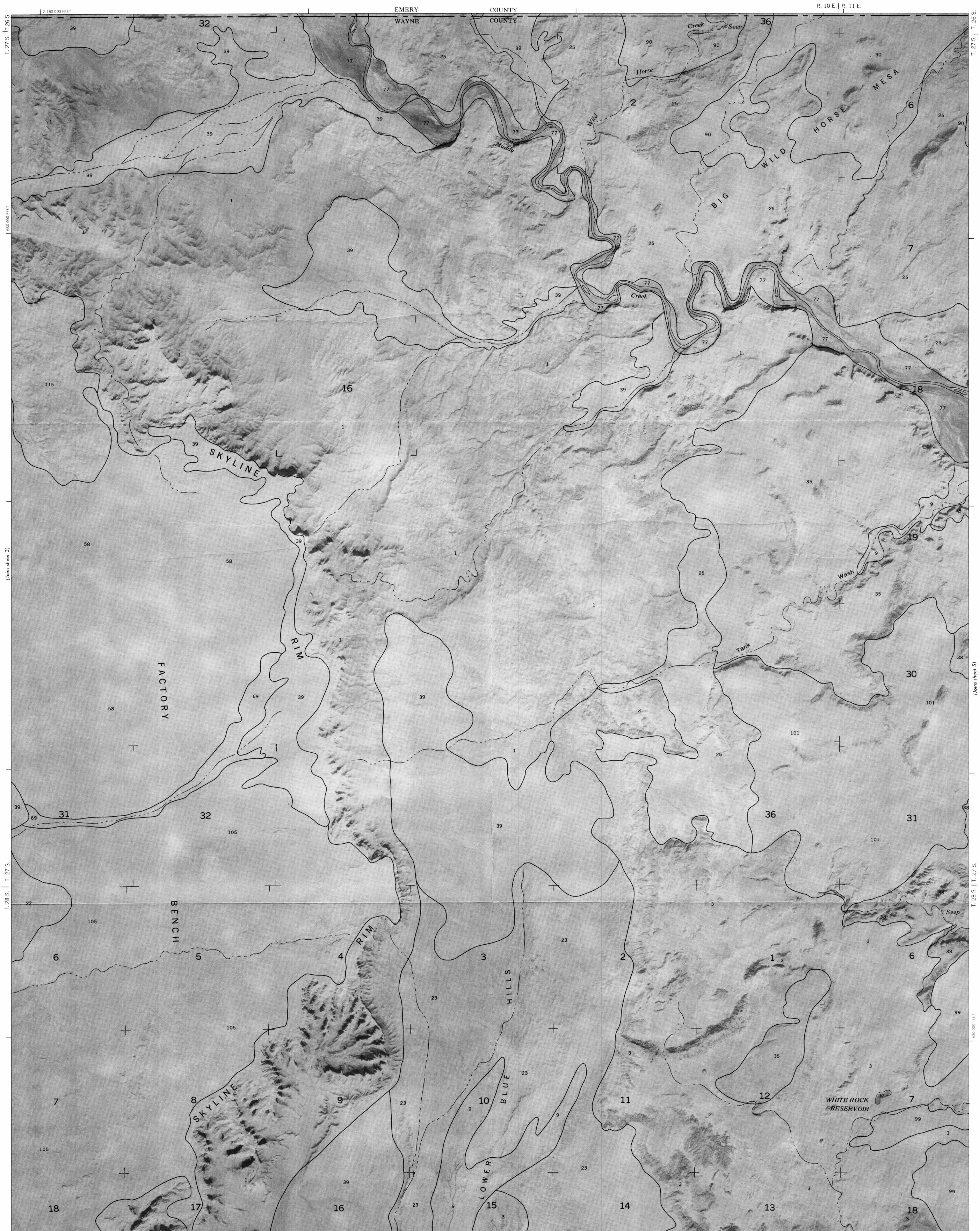


This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

HENRY MOUNTAINS AREA — UTAH NO. 3

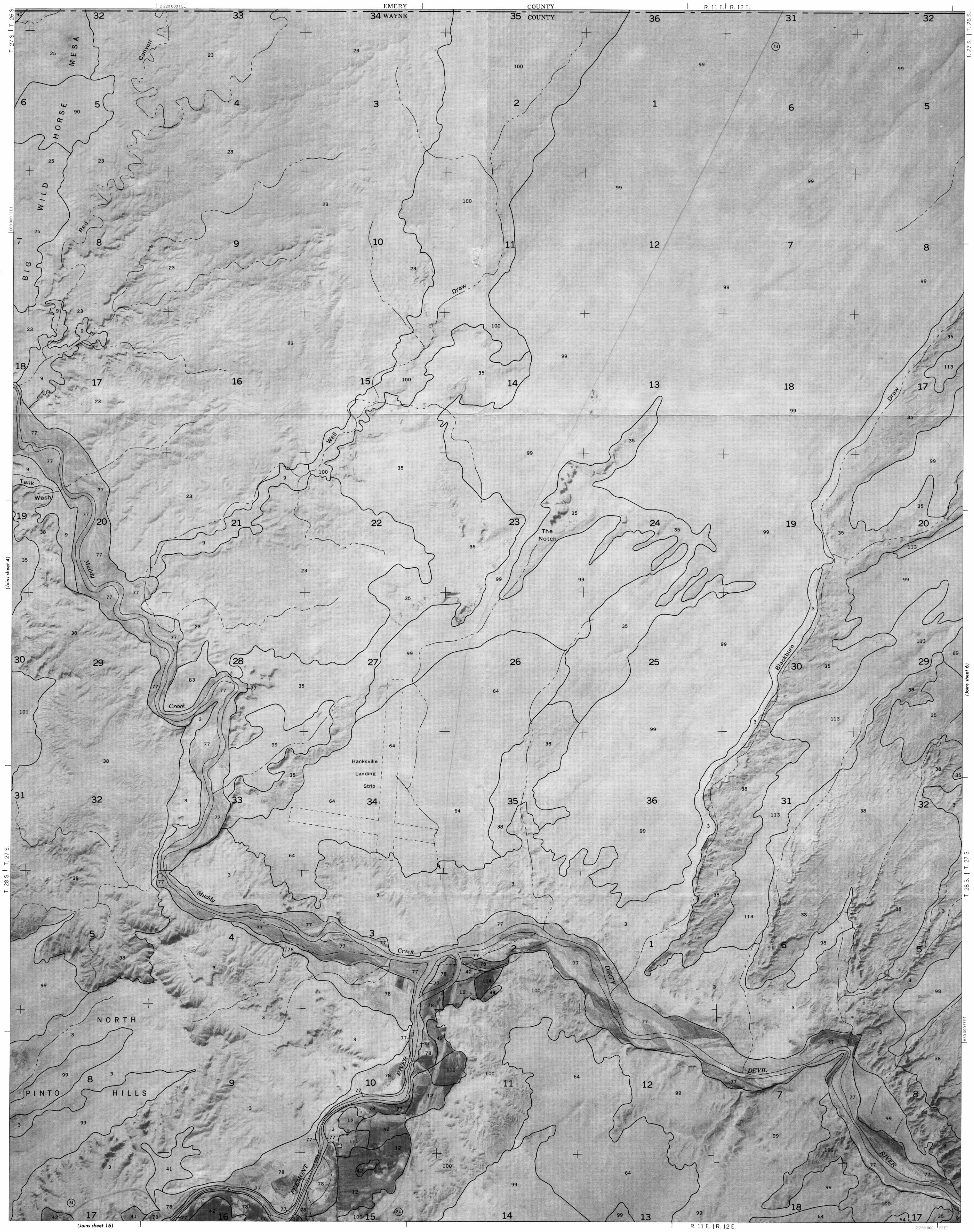


This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:24 000

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS

N



1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

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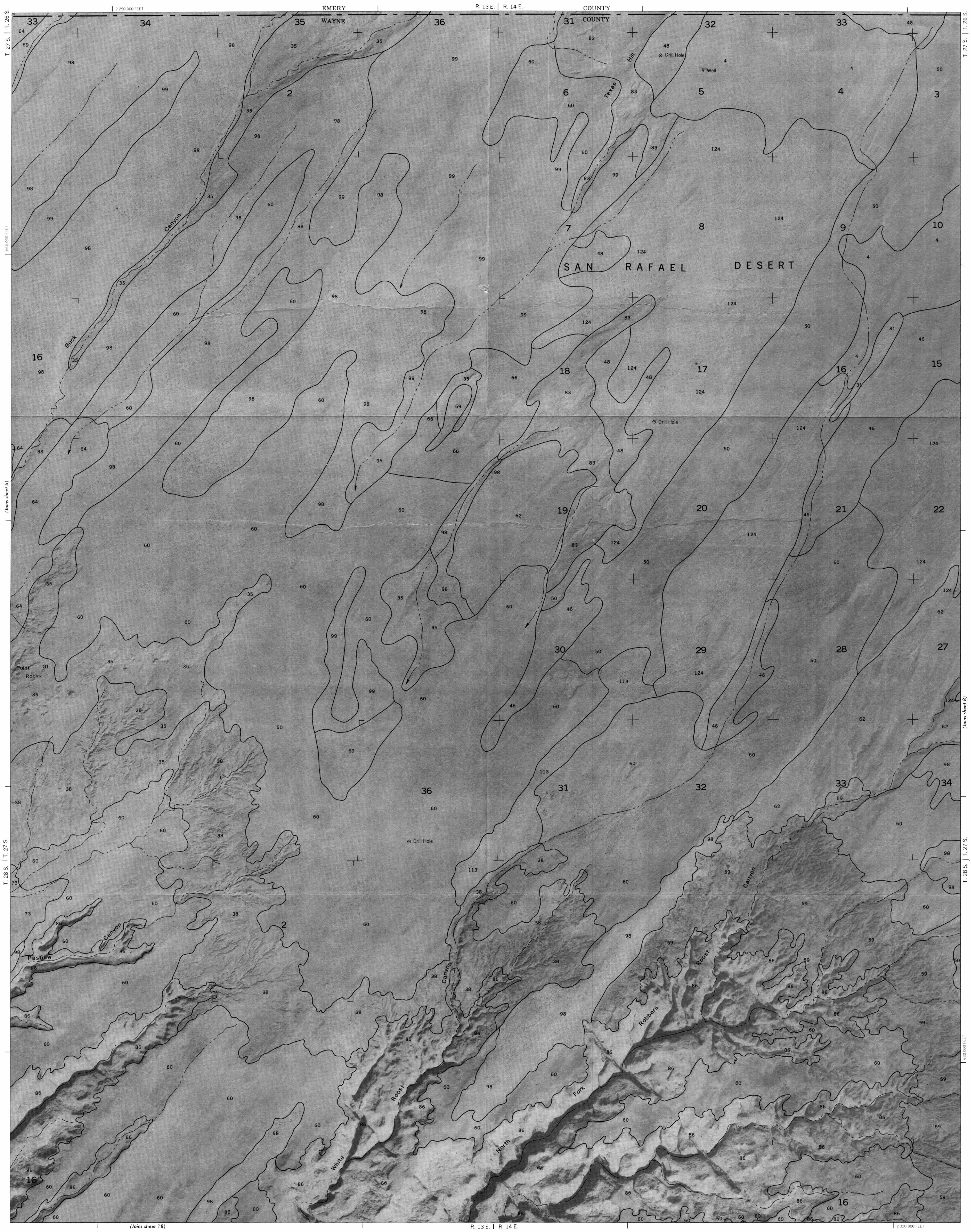
1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

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1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

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1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

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SCALE 1:24 000

2 430 000 FEET

670 000 FEET

630 000 FEET

(Joins sheet 22)

2 460 000 FEET

R. 18 E. | R. 19 E.

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

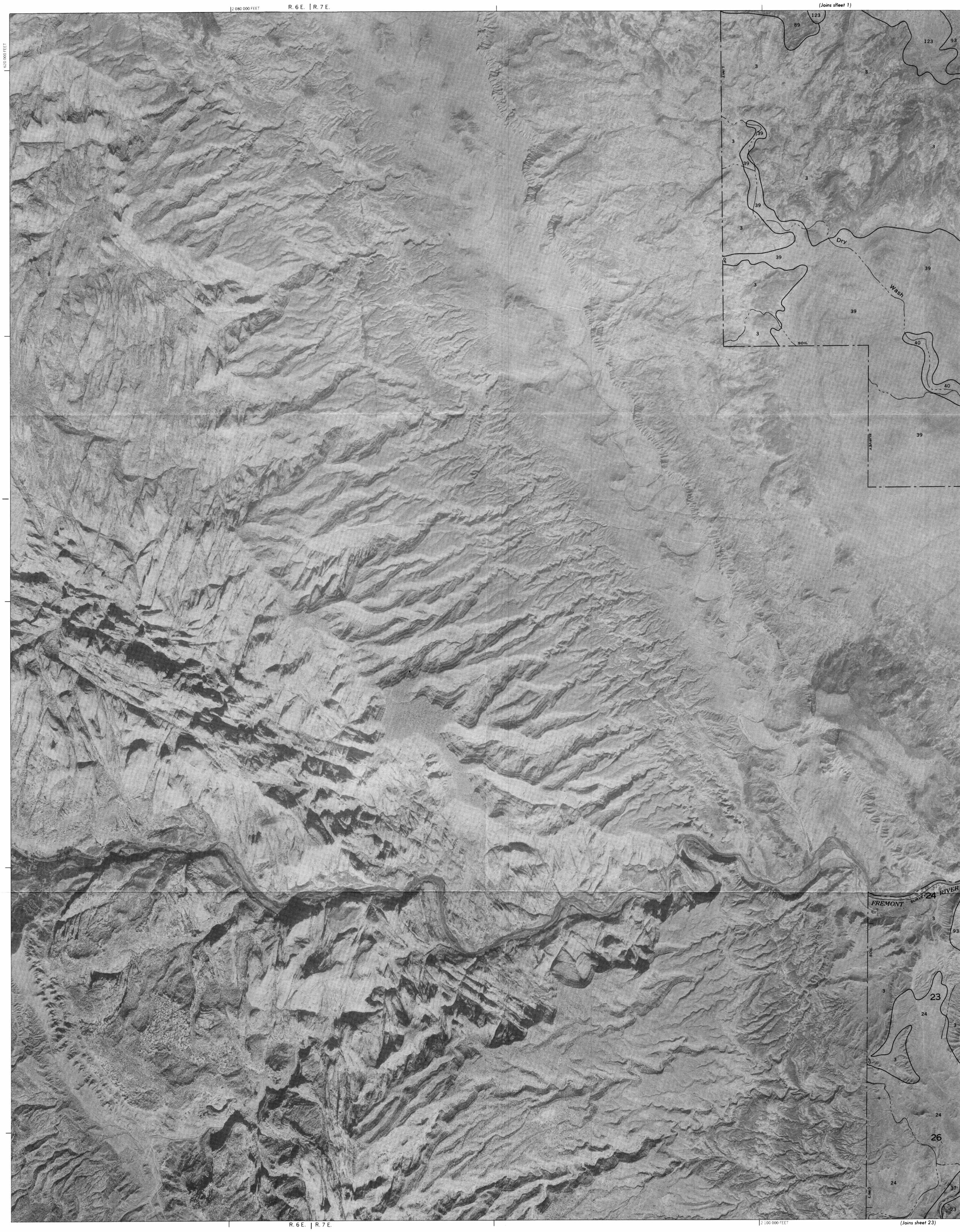
1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

HENRY MOUNTAINS AREA — UTAH NO. 11



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

HENRY MOUNTAINS AREA — UTAH NO. 14

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:24 000

HENRY MOUNTAINS AREA — UTAH NO. 15

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

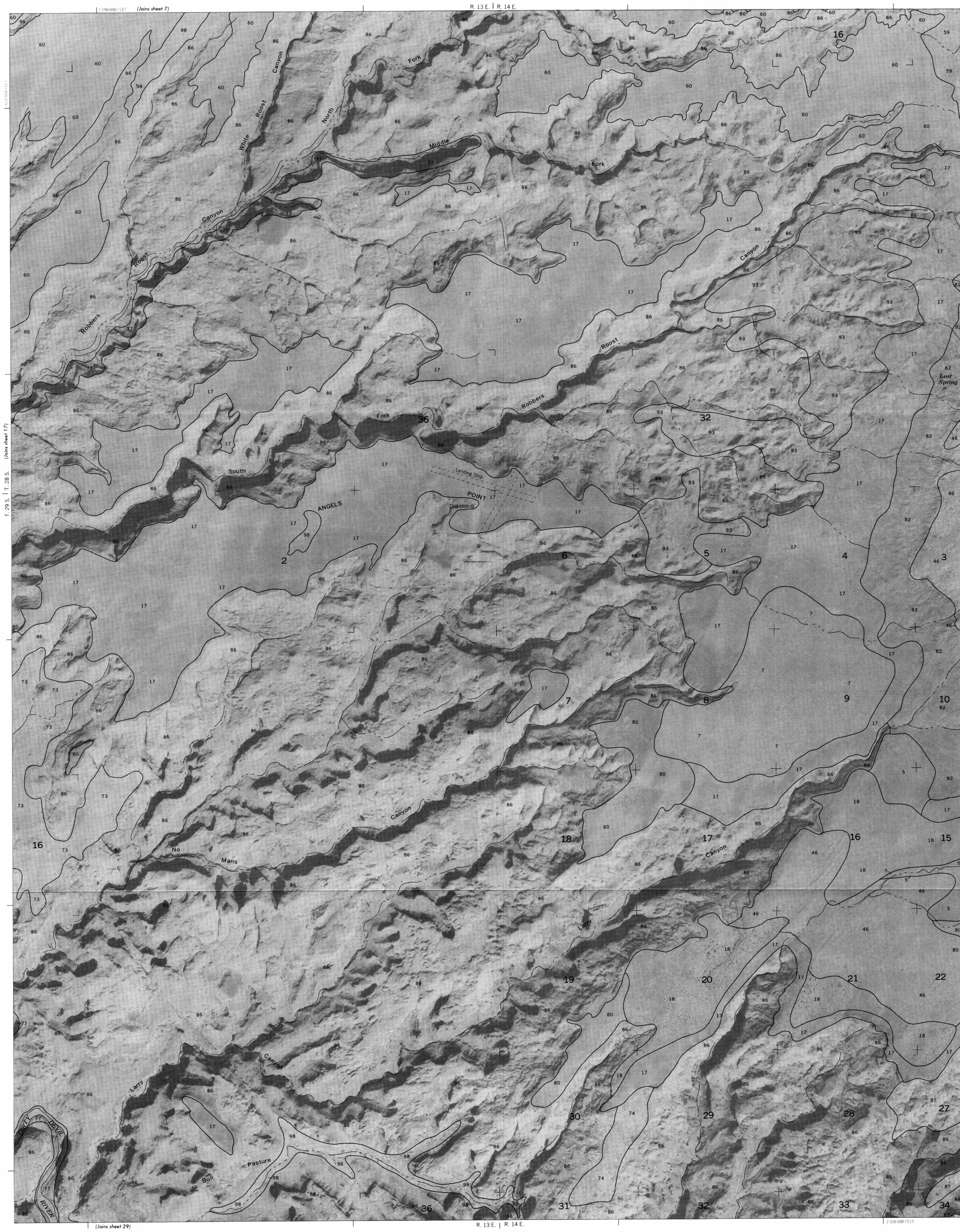
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

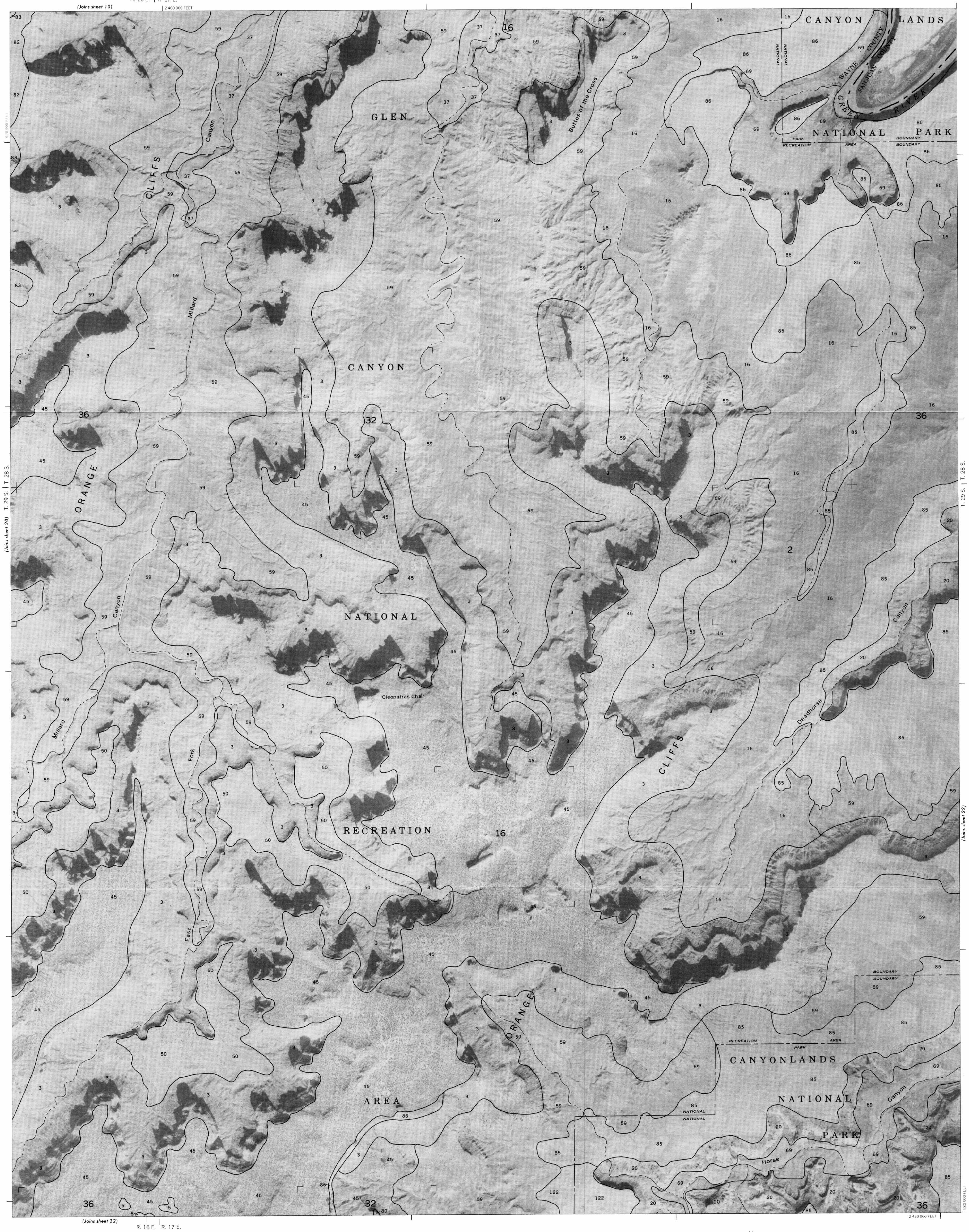
1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:24 000

N

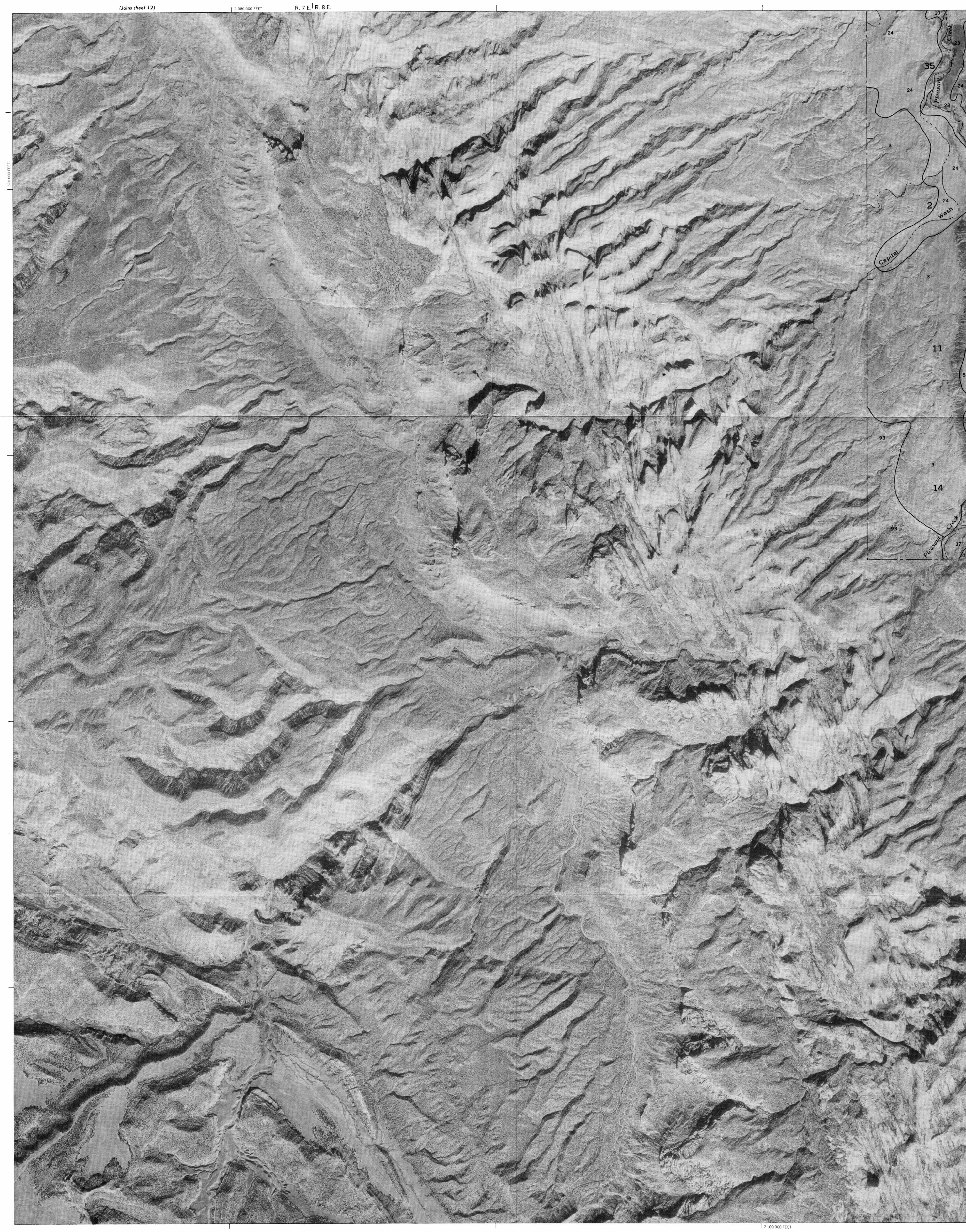
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

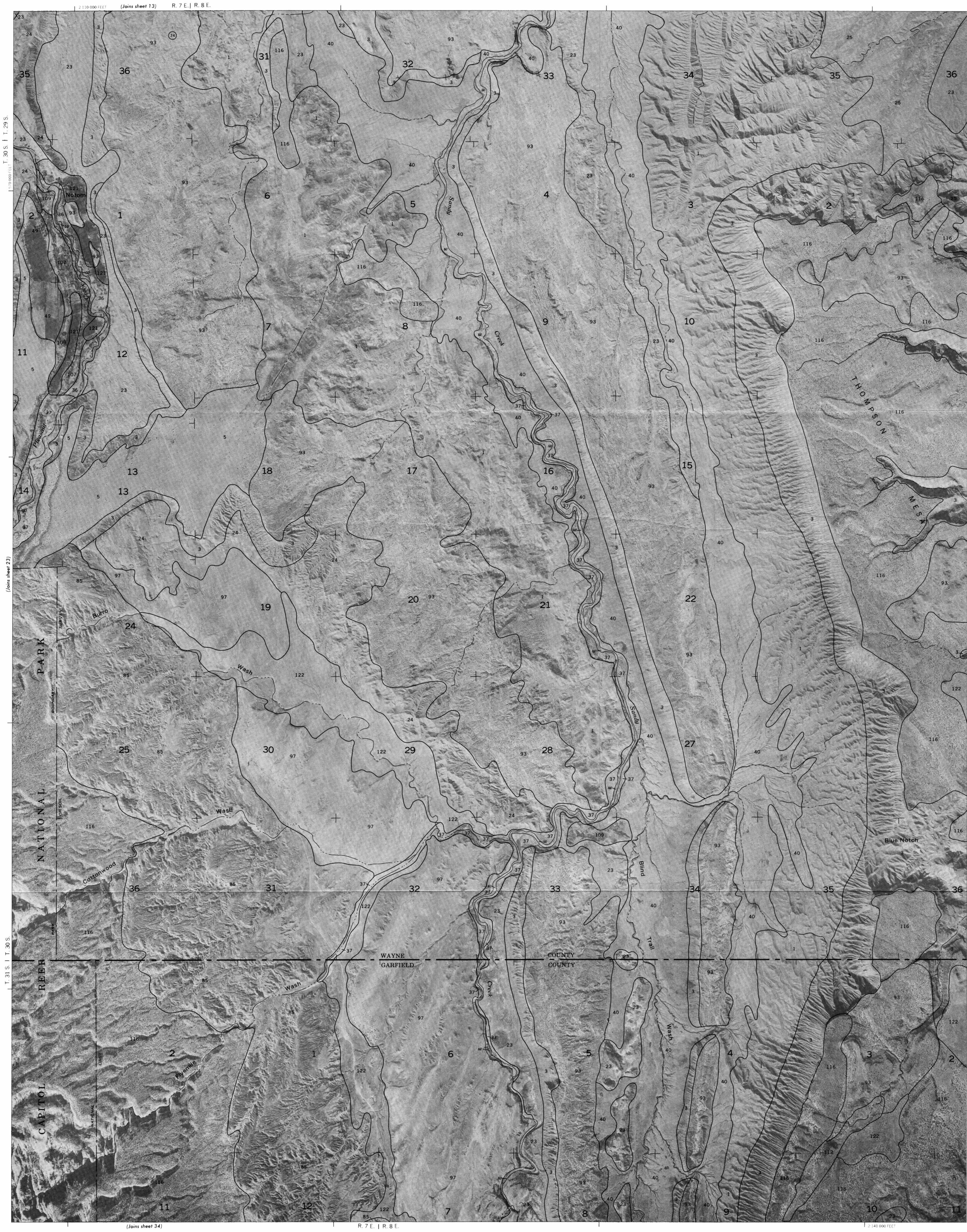
(Joins sheet 12)



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:24 000

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS

N

R. 8 E. | R. 9 E. (Joins sheet 14) 2 150 000 FEET R. 9 E. | R. 10 E.

T. 29 S. | T. 30 S. (Joins sheet 24) (Joins sheet 26) T. 30 S. | T. 31 S.

(Joins sheet 35) R. 8 E. | R. 9 E. 2 170 000 FEET

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

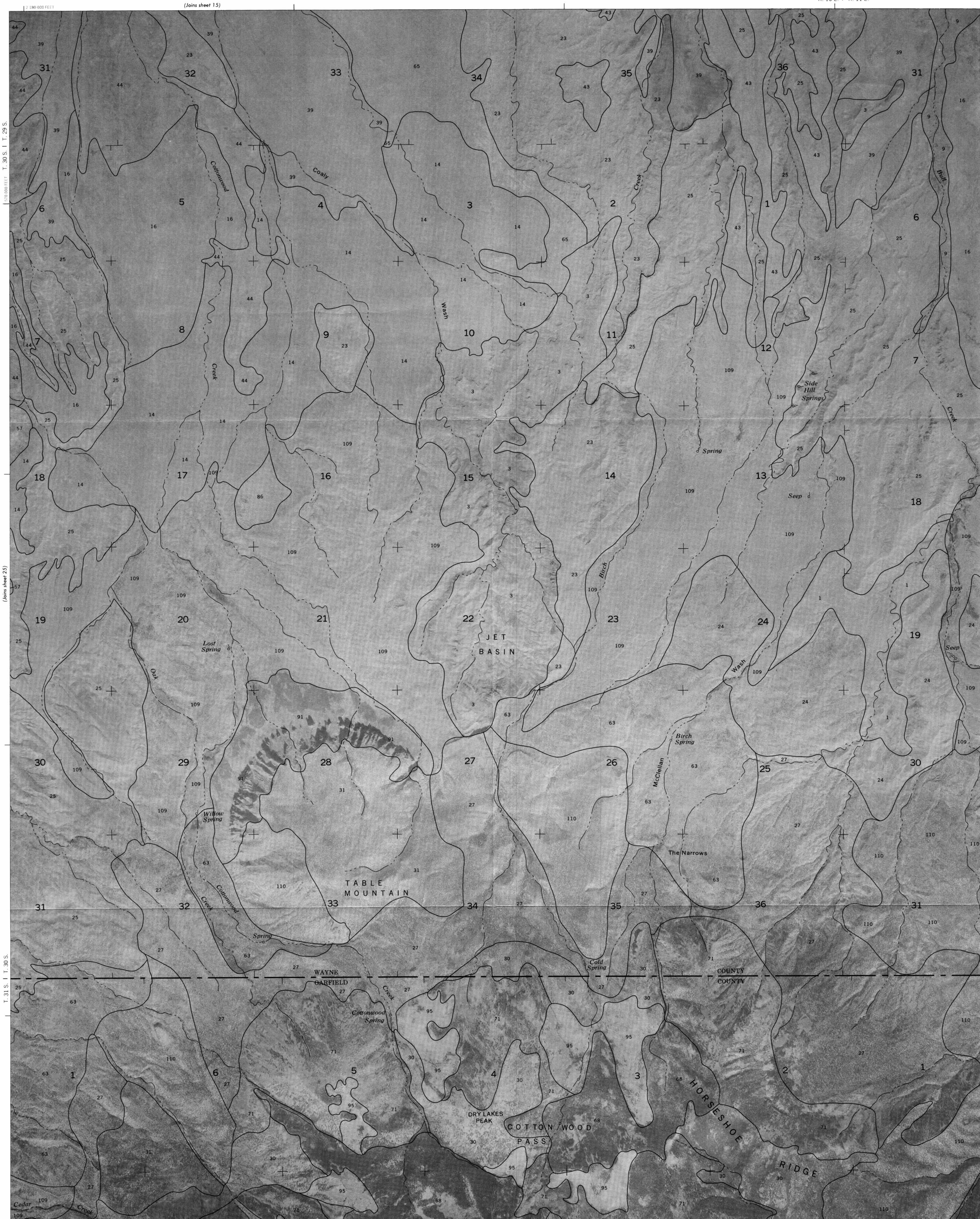
(Joins sheet 15)

R. 10 E. | R. 11 E.

T. 30 S. | T. 29 S.

(Joins sheet 25)

(Joins sheet 27)



T. 31 S. | T. 30 S.

R. 9 E. | R. 10 E.

(Joins sheet 36)

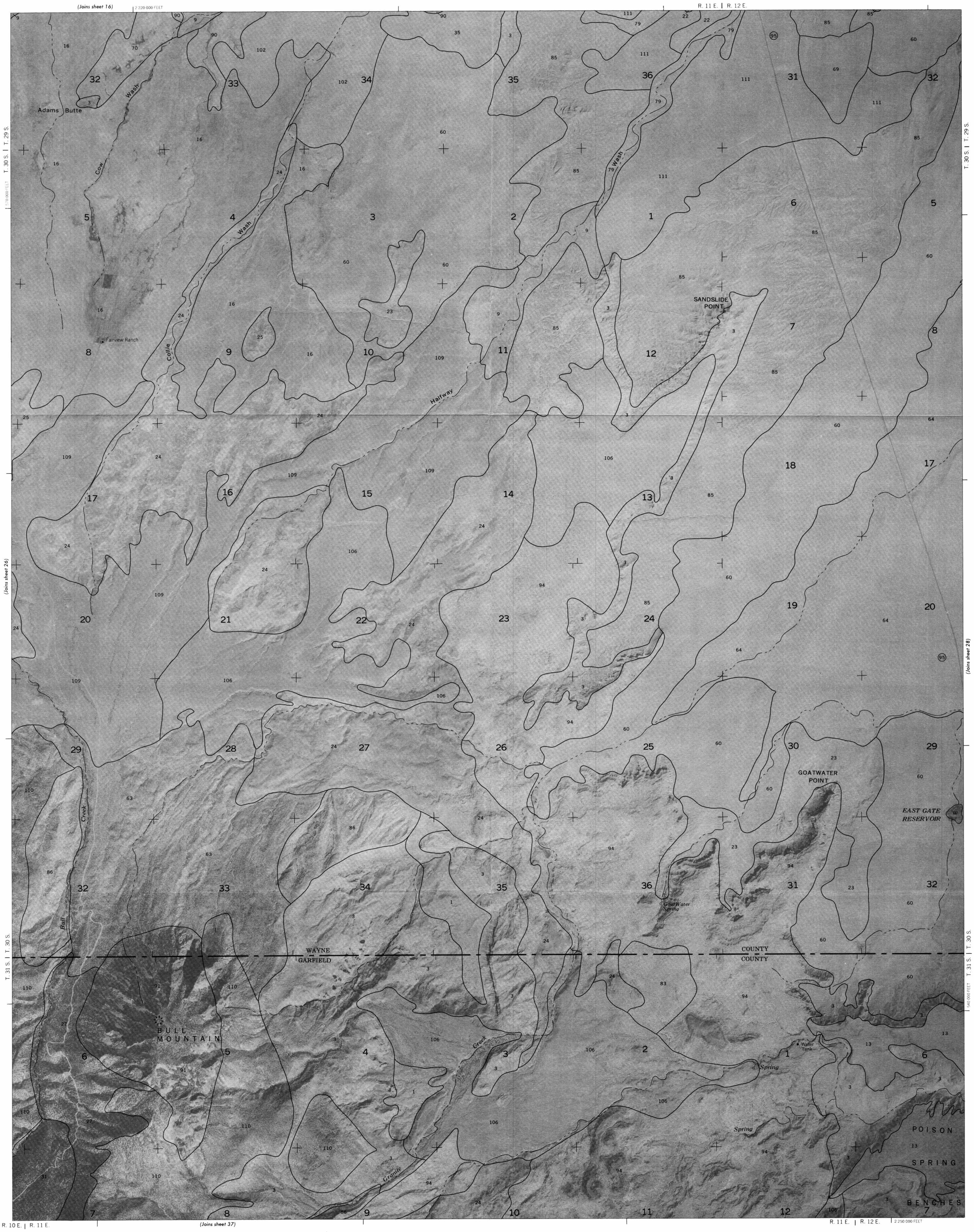
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

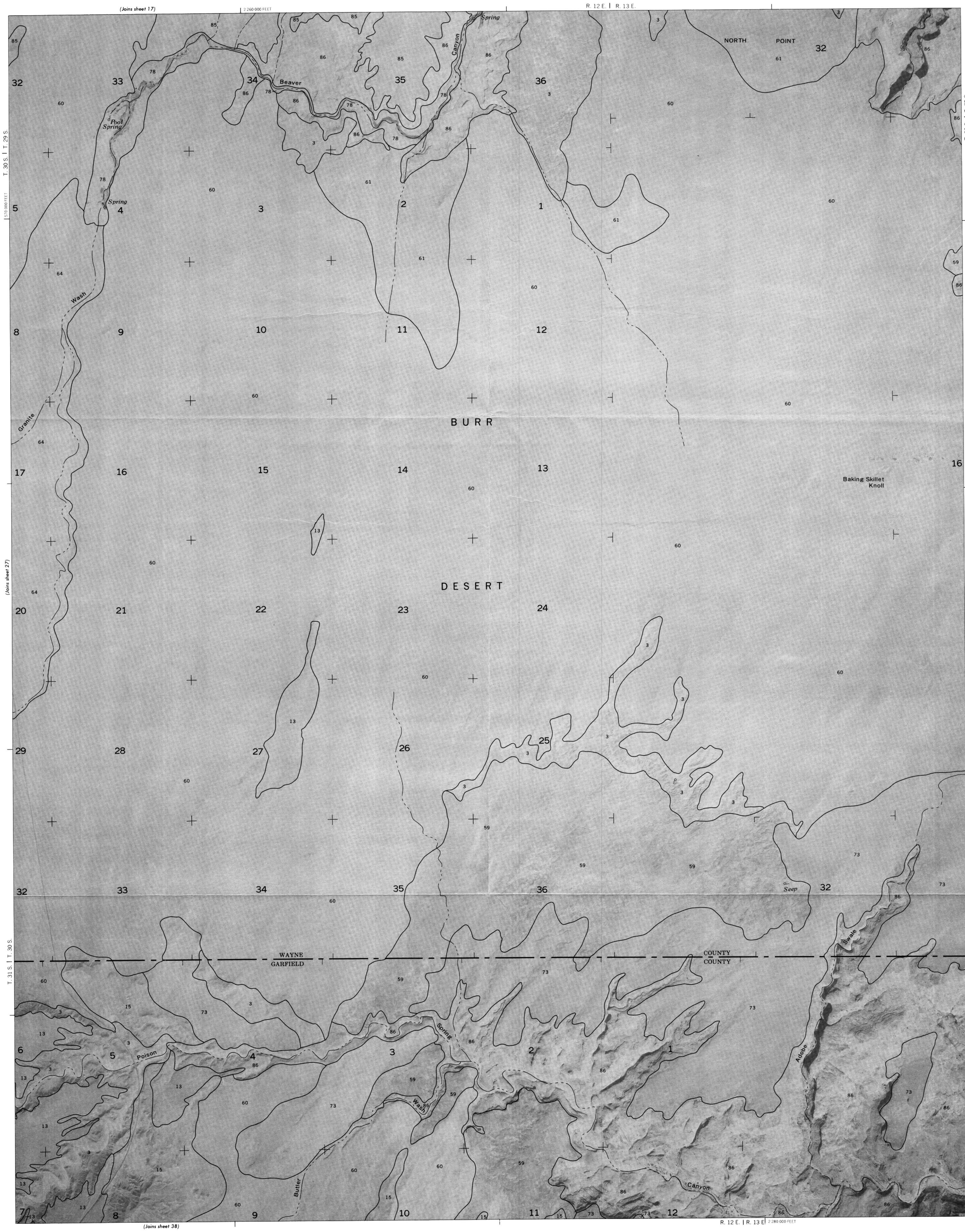
N



SCALE 1:24 000

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

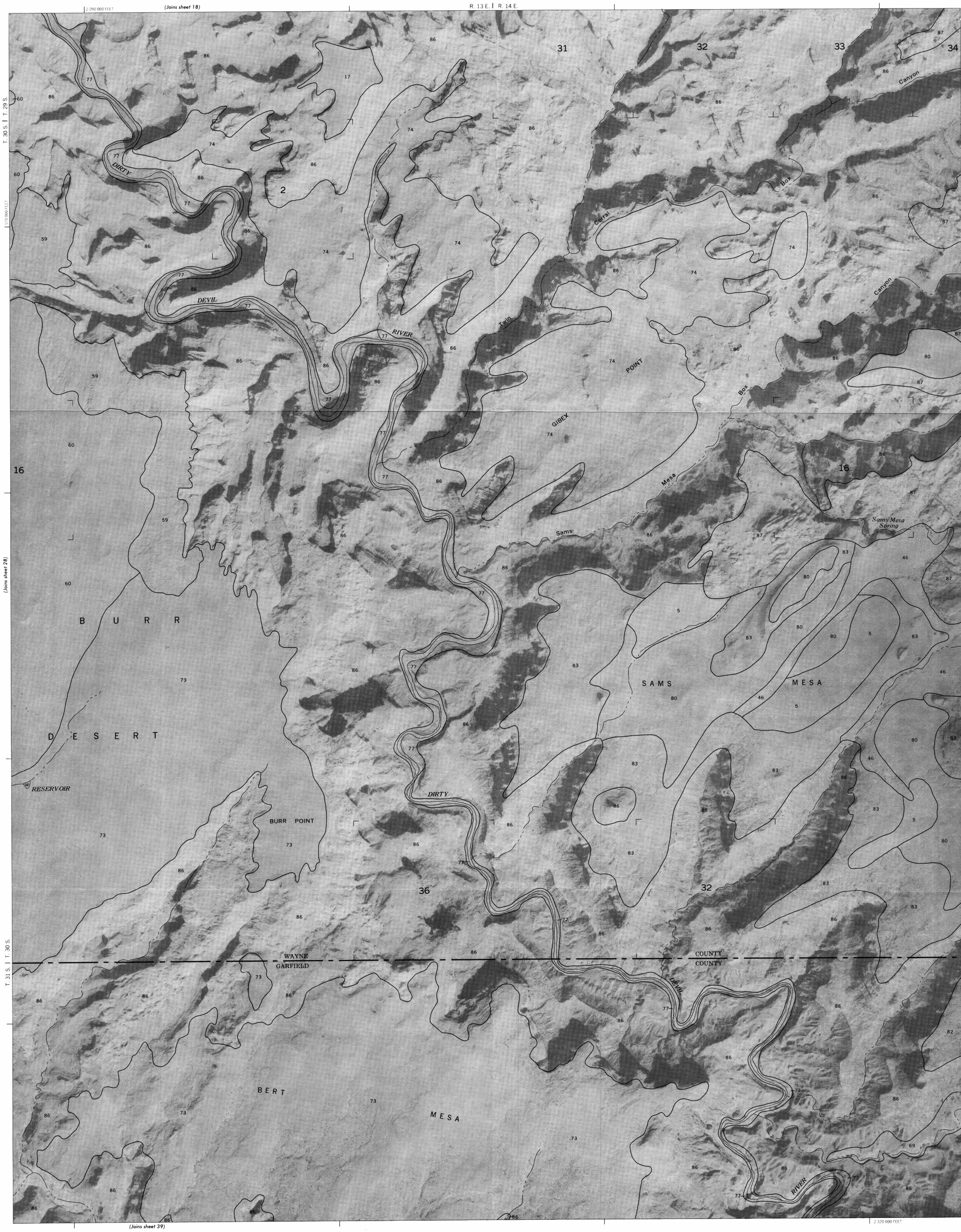
HENRY MOUNTAINS AREA — UTAH NO. 27



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

HENRY MOUNTAINS AREA — UTAH NO. 31

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

HENRY MOUNTAINS AREA — UTAH NO. 34

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

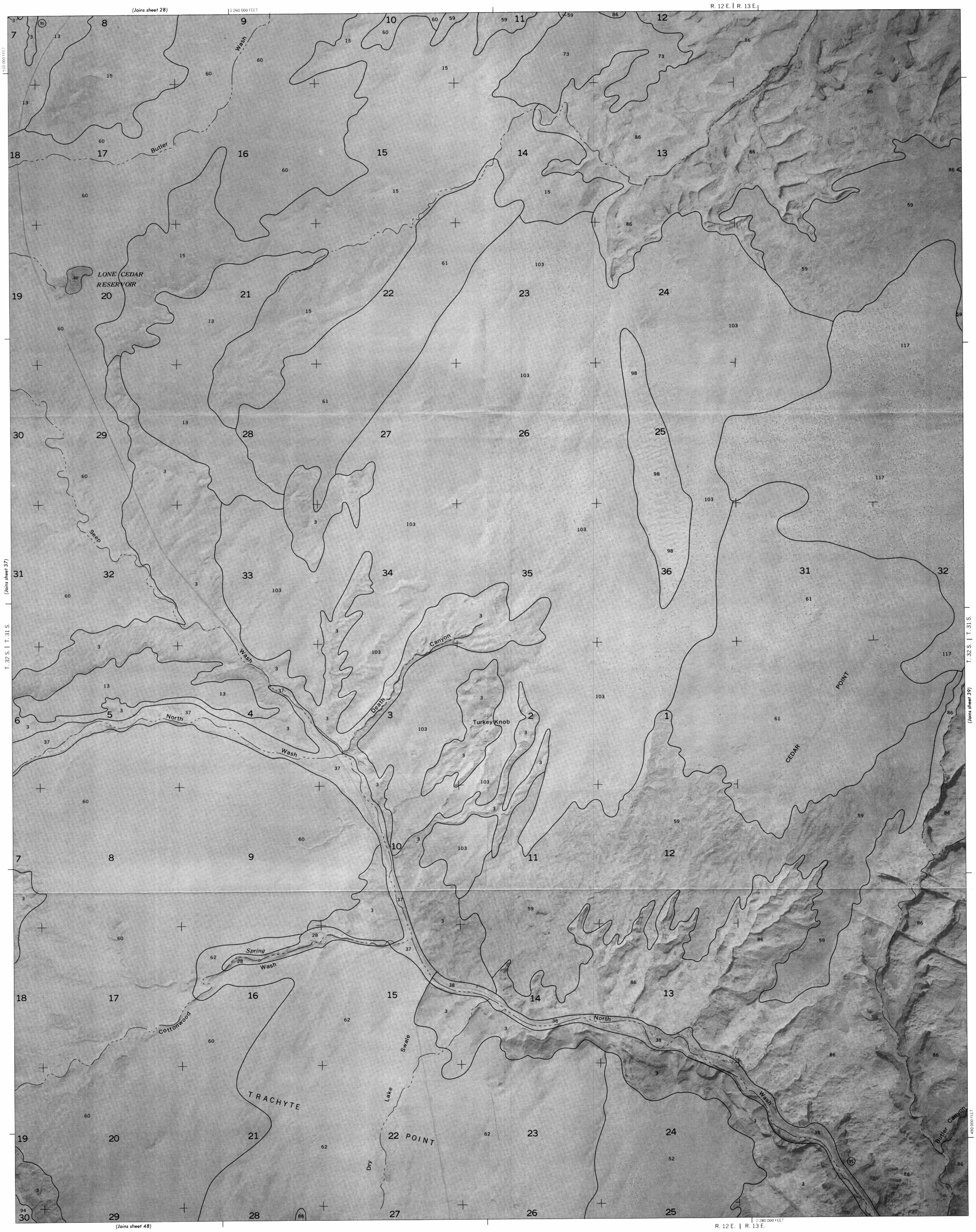
1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

HENRY MOUNTAINS AREA — UTAH NO. 37



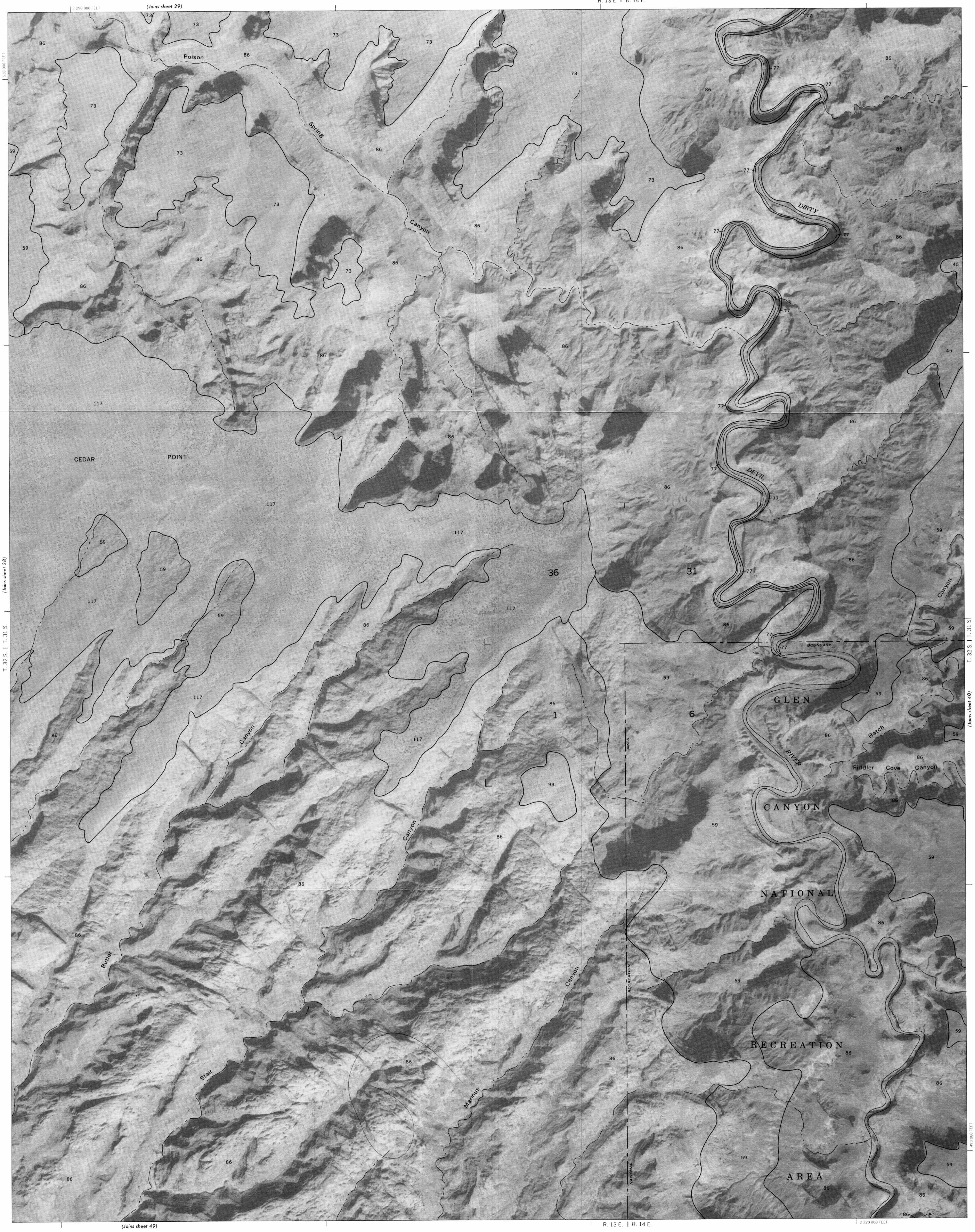
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

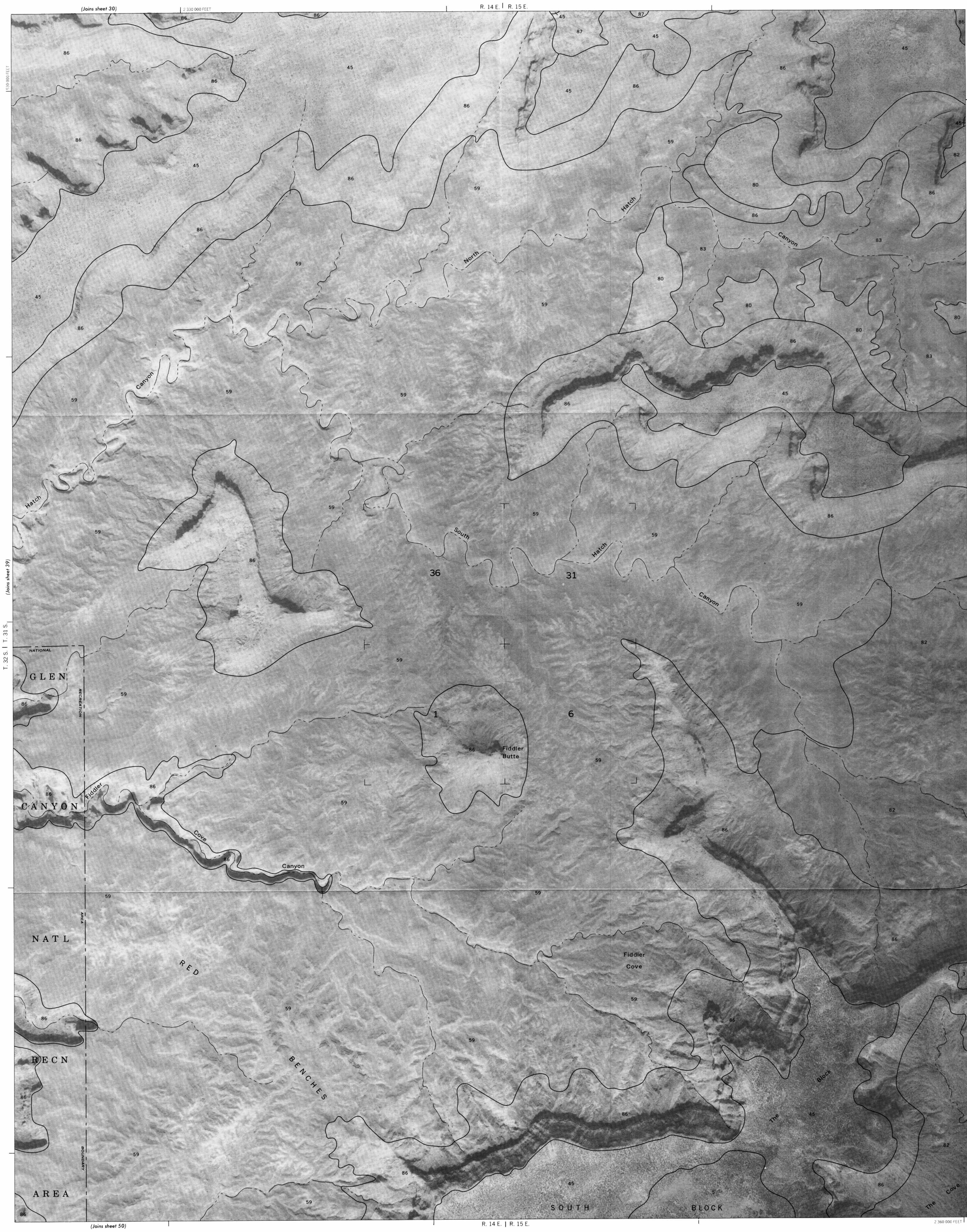
N



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:24 000

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

N

HENRY MOUNTAINS AREA — UTAH NO. 44

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

HENRY MOUNTAINS AREA — UTAH NO. 45

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

HENRY MOUNTAINS AREA — UTAH NO. 47

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:24 000

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1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

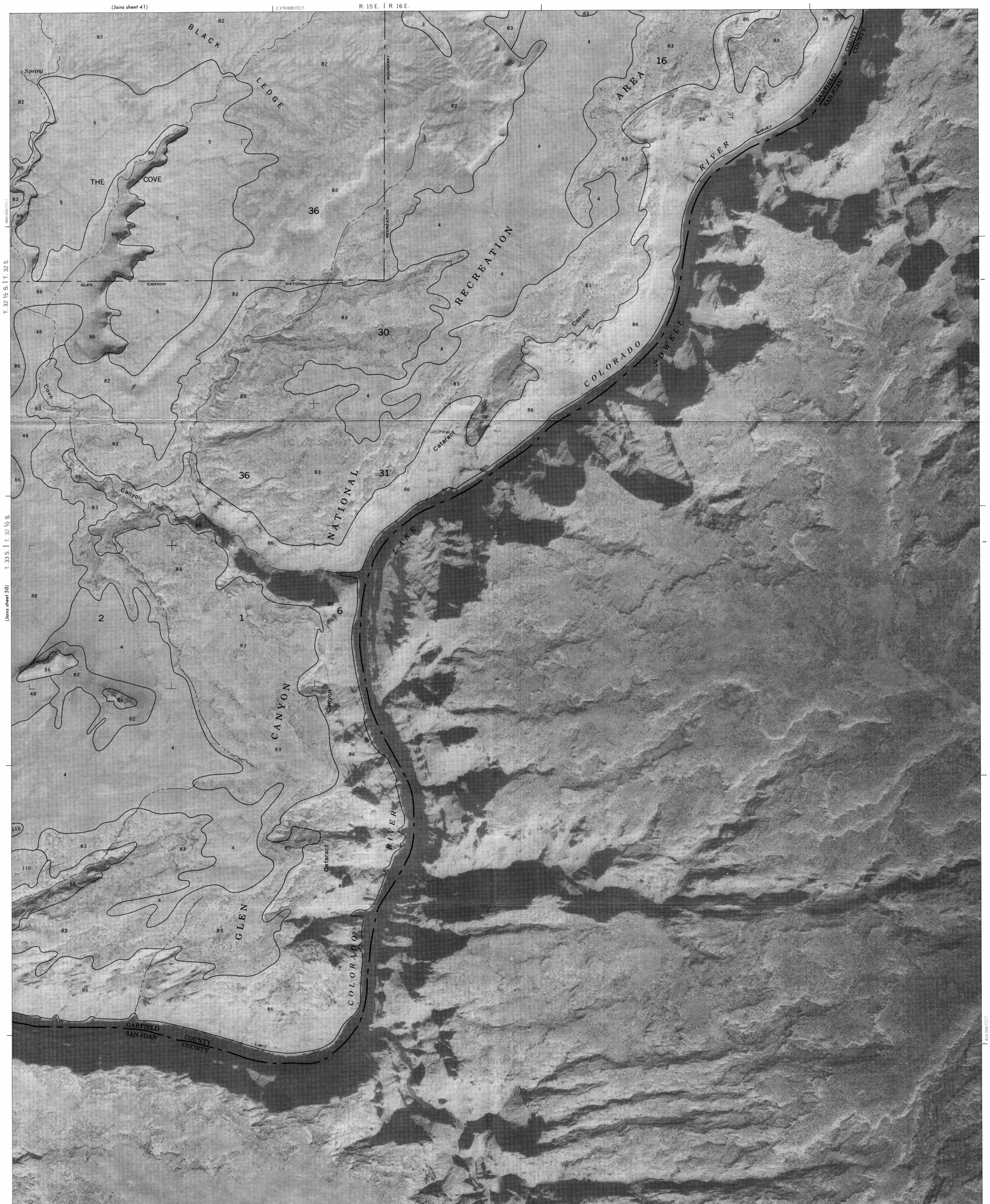
N

HENRY MOUNTAINS AREA — UTAH NO. 49

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:24 000

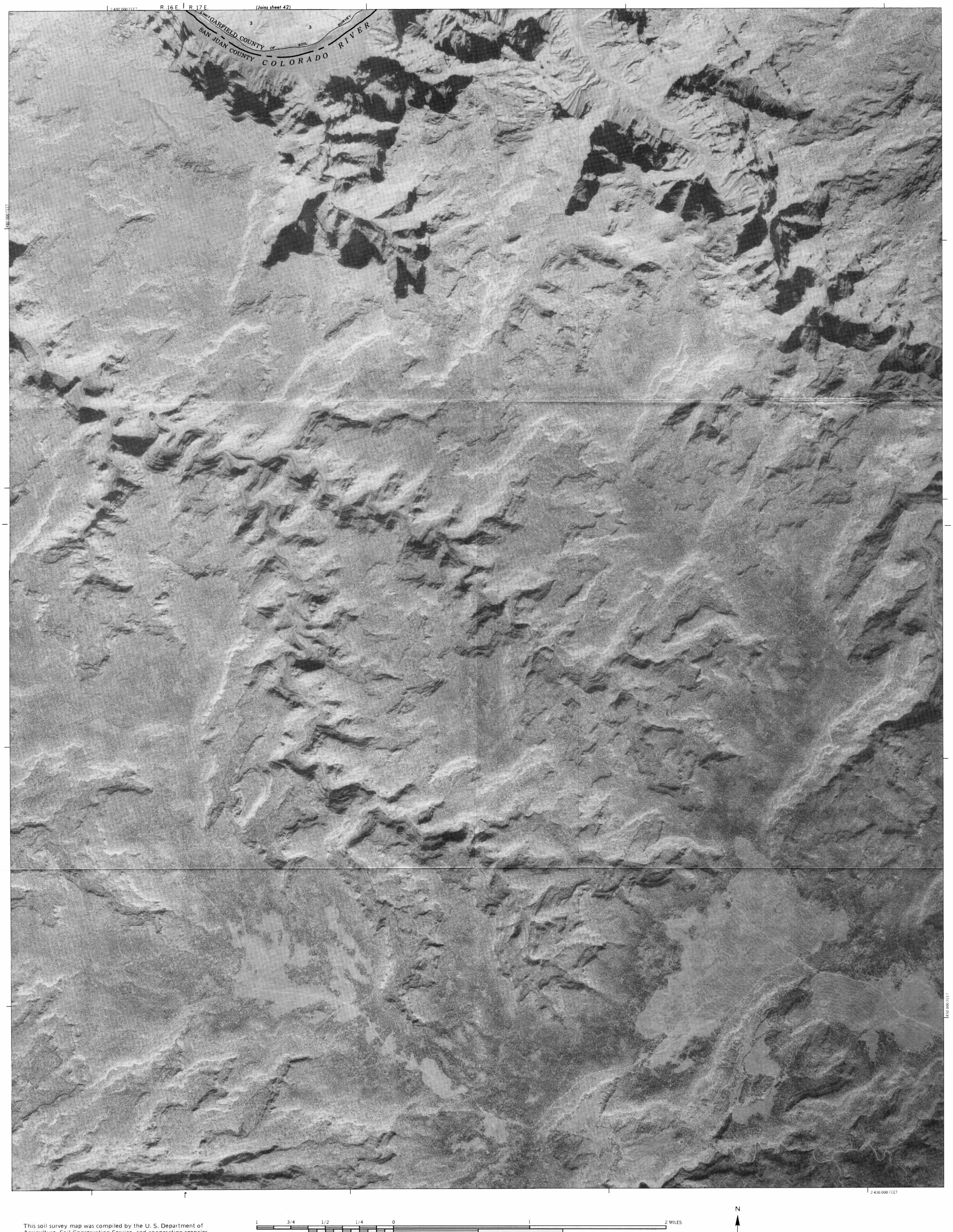
N



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

HENRY MOUNTAINS AREA — UTAH NO. 52

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

HENRY MOUNTAINS AREA — UTAH NO. 53

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

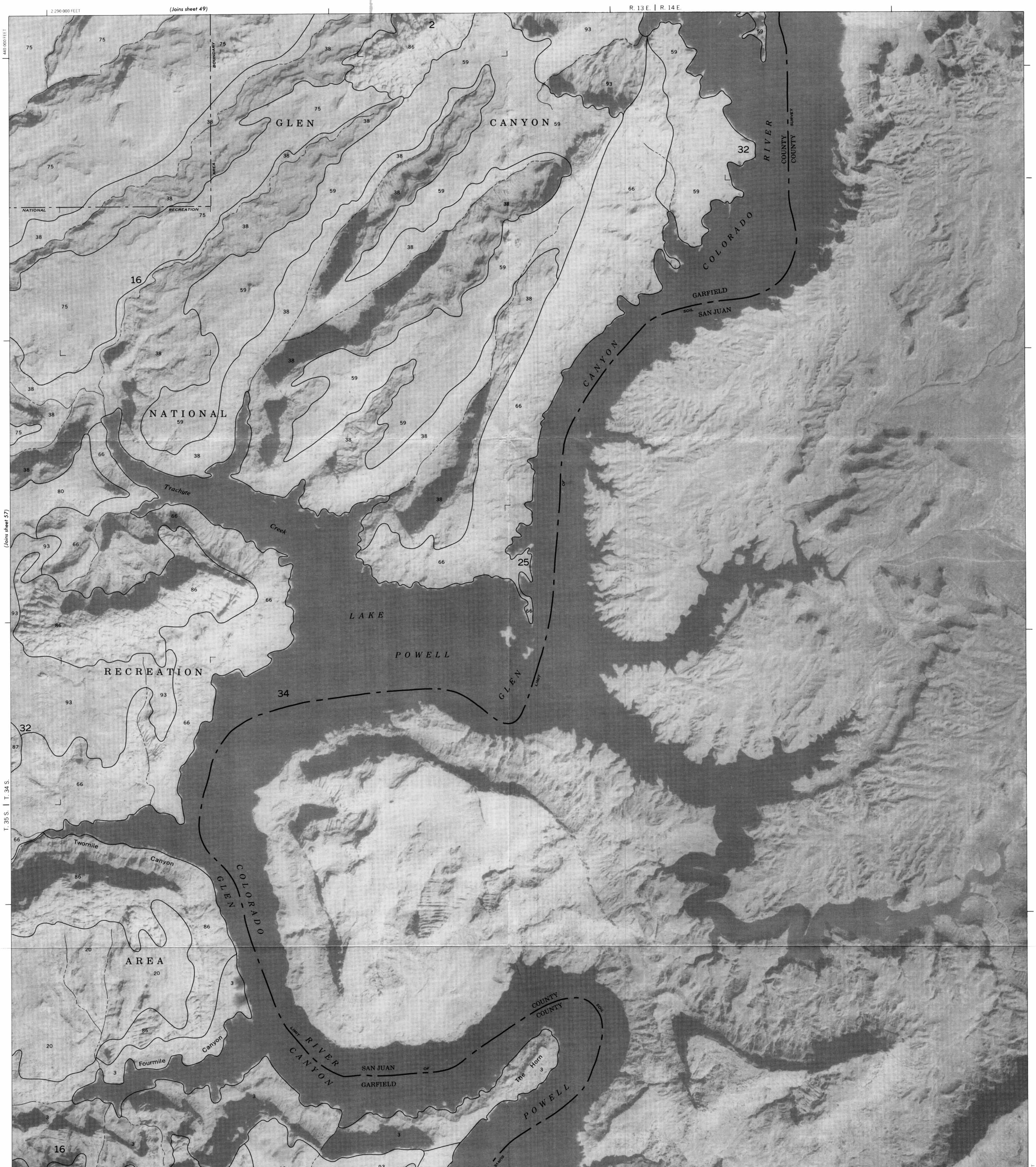
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:24 000

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

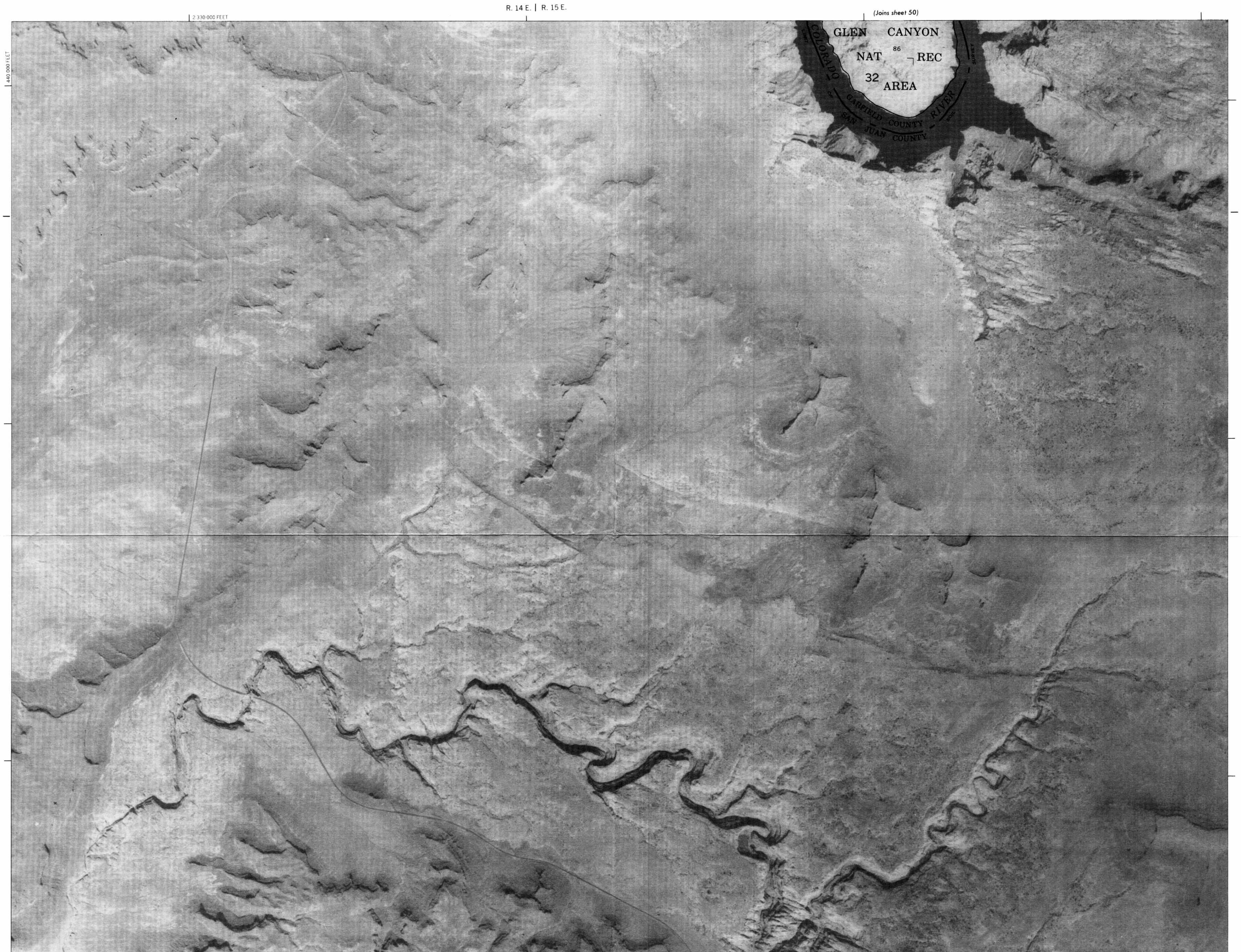
N



1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

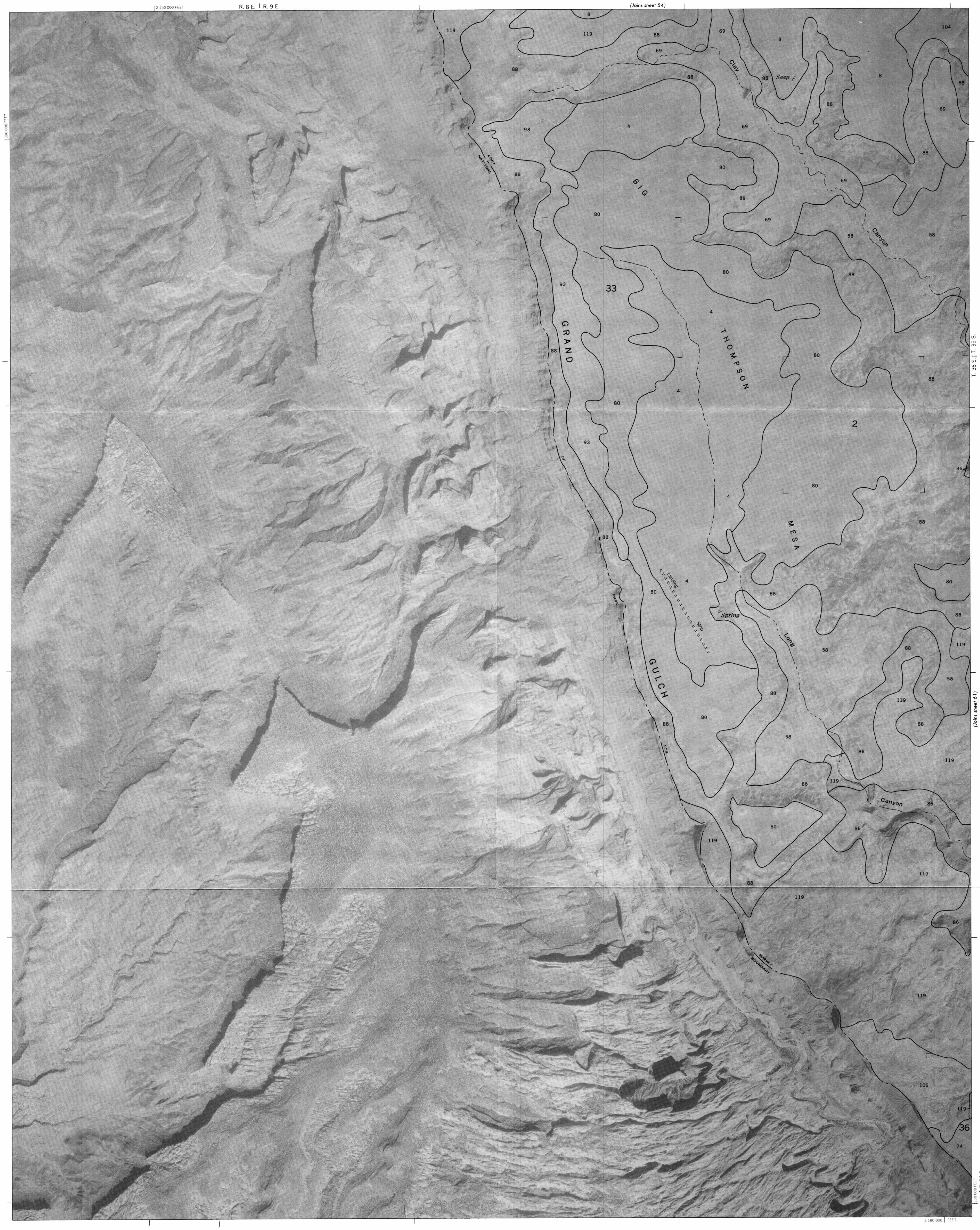
1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

HENRY MOUNTAINS AREA — UTAH NO. 59



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:24 000

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

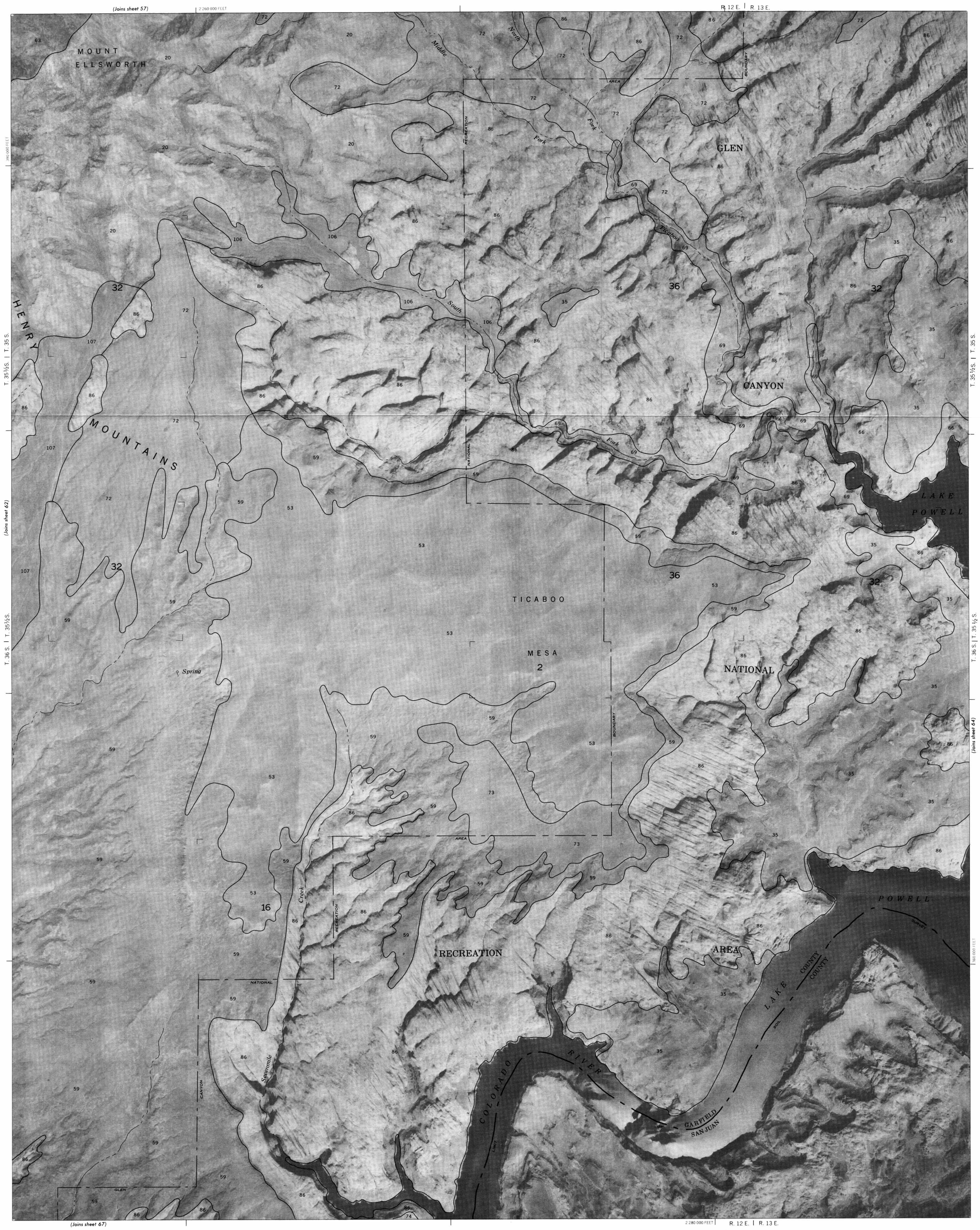
1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N



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1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:24 000

HENRY MOUNTAINS AREA — UTAH NO. 65

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of Interior, Geological Survey from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N